THE TESTED DIFFERENCES BETWEEN THE ABOVE MEDIAN AND THE BELOW MEDIAN GROUPS OF SEVENTH GRADE PUPILS OF THE LEMON STREET SCHOOL MARIETTA, GEORGIA, 1956-57 TERM

A THESIS

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THE DEGREE OF MASTER OF ARTS

BY

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DEDICATION

To my Mother

Mrs. Clara Adams

and

To my Son

Isaac Hamilton Adams

ACKNOWLEDGEMENT

The writer wishes to express his sincere thanks and appreciation to all who have contributed to the successful completion of this study. He wishes specifically to express direct gratitude to the pupils of the seventh grade class of the Lemon Street School, Marietta, Georgia; to Dr. Laurence E. Boyd and Dr. Lynette Saine, advisor and co-advisor, respectively, for their patient and painstaking direction of the conduct of this study.

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CHAPTER I

INTRODUCTION

Frame of Reference.-- Any educational provision for the child must be subject to continuous appraisal in light of best educational practice. It will modify its program and method of instruction to fit the social demands and needs of the child. In order to do this modern educational methods require that educators evaluate the work that pupils do so that the program goals of the school may be properly set. Evaluation is regarded as part of instruction and as continuous.

Not only have measuring experts said that tests should measure the objectives of a class or school level, but the program of evaluation should involve evidence as to the extent to which pupils are showing development in the attainment of these goals.

The school should deal not only with the achievement of children in such basic skills as reading, spelling, social studies, arithmetic, character, science, and social competence, but it should, also, measure the mental ability of children so that it can determine whether or not its pupils have the ability to pursue such a curriculum. Discrepancies between the levels of achievement and social development on the one hand, and the level of intelligence on the other hand, may indicate that the use of new materials and teaching methods may be needed, or that the entire program may need revamping.

To advance a child grade by grade merely because he ages year by year may be well enough for many individuals, but it seriously handicaps the boy or girl distinctly brighter than the others of the same age, and overstrains the one who is duller. To be held back and assigned tasks too

easily executed breeds laziness or restlessness and not infrequently is found to be a root cause for misconduct in the classroom. On the other hand it is uneconomical of human effort and ability to promote those less educable than others of their age. If slow pupils are forced to attempt to keep abreast of pupils who learn more rapidly, they may take refuge to a defeatist attitude -- a condition of lowered morale -- so reducing efficiency that it should be avoided at all costs.[1]

Most children in the past have been denied adequate education and some are being poorly trained now because of the lack of being exposed to adequate programs of evaluation. It is interesting to note that our most progressive schools are those which are employing every possible means to develop better evaluation programs. Improvements are being made on old instruments and new ones are being developed, but their best contribution to any school situation depends upon their improved utilization in motivating a more efficient teaching-learning situation.

The Evolution of the Problem.-- According to Good and Scates[2] one of the sources of problems is consideration of existing practices and needs. The writer is deeply concerned about the performance of the seventh grade class of the Lemon Street School. Some of the questions to which the writer seeks answers are:

1. Why do we have so many failing pupils?
2. What may account for the unusually large number of discipline problems?
3. Is the instructional program adequate?

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[1]John F. Dashiel, Fundamentals of General Psychology (Atlanta, Georgia, 1937), pp. 355-6.

[2]Carter V. Good and Douglas E. Scates, Method of Research (New York, N. Y.,) p. 36.

4. To what extent, if any, is the difference between their intelligence and achievement level?

Statement of the Problem.-- The problem involved in this study was to determine the tested differences in the intelligence and the achievement levels of the "above median" and the "below median" groups of seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-57.

Scope and Limitation of the Problem.-- This study is concerned only with the comparison of the tested differences between the "above median" and the "below median" groups of the Lemon Street School in intelligence and achievement as measured by paper and pencil variety tests. No causal factors or other influences operating upon the results obtained by the seventy pupils of the seventh grade of the Lemon Street School, Marietta, Georgia, 1956-57.are considered.

Purposes of the Study.-- The aim of this study was to ascertain the significant differences in the overall intelligence and achievement of pupils scoring above the median and those scoring below the median of the total distribution of seventh grade pupils in the Lemon Street School of Marietta, Georgia, 1956-57.

More specifically, the ultimate objectives of this research were to determine:

1. The measures of central tendency and variability in the chronological ages of the pupils who scored above and below the median, respectively.
2. The significant differences, if any, in the chronological ages of the "above median" and "below median" groups.
3. The measures of central tendency and variability in the intelligence of the pupils who scored above and below the median, respectively.

4. The significant differences, if any, in the intelligence of the "above median" and the "below median" groups.

5. The measures of central tendency and variability in the achievement of the pupils who scored above and below the median, respectively.

6. The significant difference, if any, in the achievement of the "above median" and the "below median" groups.

7. Any findings or interpretations which give promise of improved school policies, procedures, and techniques.

Definition of Terms.-- The important terms used in this study are defined in the following statements.

> The term, "intelligence", as used in this study refers to the traits of mental development as measured by the Otis Quick-Scoring Mental Ability Test.
>
> The term, "achievement", as used in this study refers to academic performance as measured by the Gray-Votaw-Rogers General Achievement Test.
>
> The term, "above median", group as used in this study refers to those pupils whose scores fell above the median of the total distribution of scores on the Otis Quick-Scoring Mental Ability Test.
>
> The term, "below median", group as used in this study refers to those pupils whose scores fell below the median of the total distribution of scores on the Otis Quick-Scoring Mental Ability Test.

Locale of the Research.-- The Lemon Street School is located in the northeastern segment of Marietta, Cobb County, Georgia, about one-half mile from its heart. According to the 1950 Census records, Marietta had a population of 20,687 persons of whom 2,991, or approximately thirteen per cent were Negroes.[1]

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[1] U. S. Bureau of the Census, Seventeenth Census of the United States, Population 11 (Washington, D. C., 1950).

There are opportunities for indulgence in recreational as well as religious pursuits and due to the fact that the city is one of the States' largest industrial areas the standard of living is above average when compared with the rest of the state.

The Lemon Street School consists of a modern brick building and a brick annex containing a total of seventeen classrooms, a cafeteria, and the necessary service rooms. All of the members of the faculty are college trained. The enrollment is approximately five hundred and eighty-five pupils all of whom live in Marietta.

Method of Research.-- The Descriptive-Survey Method of research, employing the techniques of testing and statistical treatment of the data was used. Fisher's "t" was computed as being significant at 2.58 at the one per cent level of confidence and with 70 degrees of freedom.

Description of the Subjects and Materials.-- The subjects and materials used in this study are as follows:

1. The subjects used in this study were seventy pupils enrolled in the two seventh grade classes of the Lemon Street School. Of this number forty-two were boys. Their ages ranged from eleven to fifteen years with a mean age of thirteen years. The twenty-nine girls' ages ranged from ten to fourteen years with a mean chronological age of 12.2 years.
2. The instruments used in collecting the data were as follows:
   a. The Otis Quick-Scoring Mental Ability Test (Beta: Form E. M.) by Arthur S. Otis. This test is largely verbal, but includes some numerical and a few spatial items. There are eighty questions dealing with the above named items in the test all of which are designed to measure

mental ability -- thinking power or the degree of maturity of the mind.

Reliability on the Otis Test was determined by relating forms A and B, as well as odd and even scores, within single grade groups.[1]

Evidence for validity was based upon item-selection procedures, which employed a criterion of school retardation or acceleration, and subtests of Form J of the Sanford Achievement Test for grade ranges.[2]

b. The General Achievement Test (Advanced: Form Q) by Hob Gray, David Votaw, and J. Loyd Rogers. This test is divided into ten components, elementary science, language, literature, spelling, reading vocabulary, reading comprehension, social studies, health and safety, arithmetic reasoning, and arithmetic computation. Each test has been timed and the scale of scores for each test has been equated.

Reliability on the Gray-Votaw-Rogers General Achievement test was determined by equivalent form reliability as well as by relating the present form to previous forms of the test.[3]

Evidence of validity is based upon item-selection on the basis of information gathered from all over the United States or content analysis. Grade progress is used as the criterion of emperical validity.

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[1]Anne Anatasi, Psychological Testing (New York, 1954), p. 214.

[2]Arthur S. Otis, Otis Quick-Scoring Mental Ability Test: Manual of Directions, p. 8.

[3]Hob Gray, David F. Votaw, J. Loyd Rogers, Gray-Votaw-Rogers General Achievement Test, Manual of Directors, p. 10.

Method of Procedure.-- The data of this research were gathered, analyzed, and presented as presented as follows:

1. A review, summation, and presentation of the literature pertinent to this study.
2. Orientation of the pupils.
3. The administration of the two tests, intelligence and achievement, to the subjects on February 19 and 20, 1957, respectively.
4. The establishment of the two groups, the "above median" and the "below median". These groups were determined by intelligence indices on the Otis Quick-Scoring Mental Ability Test, however these groups were not matched.
5. The data derived from these tests were assembled in appropriate tables, and figures, and statistically treated as the purposes of the study determine.
6. The means, the median, the standard deviation, the standard error of the mean, the standard error of the difference between the two means, and Fisher's "t" were the statisticaly measures used.
7. A comparison between each group from these statistics were made using the norms indicated in the standardized tests used.
8. The findings, conclusions, implications, and interpretations were written up and incorporated in the finished thesis copy.

Value of the Study.-- It is the educator's duty to modify the learning experiences of pupils to their respective levels of mental ability and to develop learners to the fullest degree of their respective ability levels. The results of the findings of this problem may be valuable as an aid in solving administrative and supervisory problems, and they may aid in the problem of properly grouping the pupils of the Lemon Street School. Further

proof of the need of standardized tests may be presented.

Survey of Pertinent Literature.-- The survey of pertinent literature for this study is presented under these categories:

1. Theories and studies in intelligence.

2. Theories and studies in achievement.

Theories and Studies in Intelligence.-- The term "intelligence is a widely used one, however, professional psychologists have not agreed on a common definition. The basic concept of intelligence emphasized the adaptability of the organism to new and different situations and seemed to identify intelligence rather closely with learning and problem-solving ability.[1] Controversies in the field of intelligence have resulted from the attempt to determine the primary abilities involved in what has been termed general intelligence. Spearman, Thorndike, and Thurstone have done outstanding work in this area.

Spearman[2] has held that all intellectual abilities, when analyzed, resolve themselves into two types of factors. One of these, the "g" or general factor, is involved in all mental activities; the other special factors, designated as "s" by Spearman, are highly specific and are found only in certain activities that require these special abilities. Abilities dependent upon "s" factors are said to be loosely organized and the correlation between these abilities is low.

Musical ability, mathematical ability, and mechanical ability are examples of abilities largely dependent upon certain "s" factors. The slight positive correlation between these and other abilities is a result of the "g" factor which enters into each specific ability. Spearman has accumulated

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[1]Wendell W. Cruze, General Psychology For College Students (New York, 1951), p. 291.

[2]Ibid., p. 292.

a large mass of mathematical and statistical evidence to support his concept of intelligence, but many psychologists and statisticians do not agree with him.[1]

Thorndike[2] has developed a concept of intelligence which denies the existence of the general factor as a psychological entity. He contends that there are intelligences instead of intelligence, and there is a separate intelligence for each type of intellectual task. This theory, known as the "Synthetic Theory" of intelligence, is quantitative in nature and conceives of differences in intelligence in terms of differences in number of neural connections rather than by assuming the possession of a different quality of intellect. General intelligence, according to this theory, is a mathematical abstraction, a total of specific abilities, rather than a separate and distinct component of intellectual capacity. Thorndike, too, has failed to convince all psychologists that his theory explains the true nature of intelligence.

L. L. Thurstone[3] of the University of Chicago, has produced evidence that seven primary abilities are basic to what is commonly referred to as general intelligence. He used 240 students at the university as his subjects. Each student was given a large battery of tests, verbal and performance, that required fifteen hours to complete. He assumed, since the results correlated with each other to some extent, that those tests which correlated highly with each other were measuring the same ability to a large extent. These primary mental abilities were identified: N, number ability, S, ability to visualize two-and-three dimensional spaces; M, memory ability; W, word facility or fluency; V, verbal comprehension; P, perceptual

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[1] Ibid., p. 292.

[2] Ibid., p. 292.

[3] Ibid., p. 293.

ability; and R, reasoning. The abilities identified by Thurstone with the greatest confidence are N, V, W, M, and S.

Kelly's[1] work in the interrelations of mental abilities led him to believe that the following factors are basic in intelligence: verbal ability, number ability, ability to deal with spatial relations, motor ability, musical talent, social intelligence, mechanical ability, interests, and physical strength.

These are all important factors in determining the level of "general ability" possessed by an individual and differs from Thurstone in that they represent larger groupings of abilities.

Garrett[2] states that the concept of general intelligence is too broad to be of much practical value. For convenience in treatment, therefore, psychologists often distinguish three kinds of three areas of intellectual activity, the abstract, the mechanical, and the social. Variations of these three aspects of intelligent behavior are large from person to person and are often considerable within the same person.[3]

Psychologists agree that the range of intelligence is our population varies greatly, although the great majority of people tend to cluster about the mean or average. In terms of I. Q. this score is 100.

Annatasi[4] states that the more intelligent individual will be more successful in his school work and will pursue his education farther than the less intelligent. Intelligence differences are regarded as the cause rather than the effect of educational differences.

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[1] Ibid., p. 293-294.

[2] Henry E. Garrett, Psychology (Atlanta, Georgia, 1950), p. 203.

[3] Ibid.

[4] Anna Annatasi, Differential Psychology (New York, 1937), p. 102.

Dashiel[1] asserts that to evaluate properly a given person's intelligence rating it is important to know how he compares with the population of which he is a member.

Theories and Studies in Achievement.-- This section of the review of pertinent literature deals with theories and studies in achievement as related to this study.

Epps[2] found that mental ability as measured by mental ability tests in associated with success and is more closely associated with "school achievements."

According to Wesely and Adams[3] performance upon an achievement test reflects intelligence, industry, the firmness of the curriculum and the quality of teaching.

Paul Jacobson, et al[4] states that before one compares the achievement of the pupils of one school with those in another, or the pupils of one teacher with those of another teacher in the same school the ability of the pupils should be known.

They further state that "It is obviously unfair to expect achievement to be equal when ability is unequal."[5]

Professor Lewis M. Terman[6] and his associates have made the most thorough follow-up study of the later achievements of very bright children. In 1921-1922 more than a thousand children of I. Q. 140 and above were located in

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[1]John F. Dashiel, Fundamentals of General Psychology, (Atlanta, Georgia, 1937), pp. 351-52.

[2]Alonzo L. Epps, "A Comparative Study of Intelligence, School Achievement, and Non-Attendance Students in the Fifth and Sixth Grades of the Lumber City High School, Lumber City Georgia," Unpublished Master's thesis, School of Education, (Atlanta University, 1955), p. 18.

[3]Edgar B. Wesely and Mary A. Adams, Teaching Social Studies (Boston, Massachusetts, 1952), p. 422.

[4]Paul Jacobson, et al., Duties of School Principals (New York, 1950), p. 597.

[5]Ibid., p. 296.

[6]Henry E. Garrett, Psychology (New York, 1950), p. 231.

elementary and high schools. These children would rank in the top one per cent of the general population. Sixteen years later, the careers of these young people now 25 to 35 were examined and their progress assessed. Nearly 90 per cent of the boys and 85 per cent of the girls had gone to college; they had won more academic honors than their classmates, though nearly two years younger on the average; more than half had gone into graduate and professional work, and 12 per cent had received the Ph.D. degree -- All in all, these bright children showed an impressive record of accomplishment.

Garrett,[1] also, says that psychologists have found that abilities are positively related. That is to say, people tend more often to be above average or below average in all their achievements than far up on some and far d down on others.

Summary of Literature.-- The literature that was reviewed in this study was concerned primarily with the differences between groups in intelligence and achievement.

The most significant point that was gathered from the literature is that intelligence and achievement are very closely related, and that the degree of achievement depends upon the degree of intelligence.

Subsidiary points disclosed in the review of the literature are as follows:

1. The range of I. Q.'s varies greatly, but according to norms set up by the achievement of people all over the country the majority seem to cluster about the mean or average score of 100.
2. When a person or a group of persons intelligence is evaluated they must be compared with the population of which they are members.

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[1]Henry Garrett, Psychology (Atlanta, Georgia, 1950), p. 208.

3. The literature, also, points out that people tend more often to be above average or below average in their achievements rather than good in some and bad in others.
4. The correlations between intelligence-test scores and school performance are high but by no means perfect because other factors have to do with achievement, for example, health, personality traits, and work habits. However, the score that he makes upon a good intelligence tests is the best indicator of probable school achievement.

CHAPTER II

PRESENTATION AND INTERPRETATION OF DATA

Treatment of the Data.-- This chapter deals with the presentation, analysis, and interpretation of the data which were gathered to ascertain the differences, if any, between the "above median" and the "below median" groups of seventh grade pupils of the Lemon Street School, Marietta, Georgia.

The requisite data for this research were collected and organized under the following captions: (a) data on the chronological ages of the two groups of subjects, (b) data on the intelligence of the two groups of subjects, and (c) data on the school achievements of the two groups of subjects. These data were secured through the administration of two tests: the Otis Quick-Scoring Mental Ability Test (Beta: Form E.M.) and the Gray-Votaw-Rogers General Achievement Test, (Advanced: Form 2).

The membership of the two groups, "above median" and "below median" was determined by intelligence indices on the Otis Quick-Scoring Mental Ability Test.

The means, the median, the standard deviation, the standard error of the mean, the standard error of the differences between the two means, and Fisher's "t" were the statistical measures used. These data are presented in the following series of tables and figures:

1. There are fourteen tables and fourteen figures which will present the frequency distribution of the thirty-five "above median" and the thirty-five "below median" pupils on each of the fourteen variables of the tests. The tables will show the statistical measures of central tendency and variability.

2. There are fourteen tables which will show the comparative statistics of the thirty-five "above median" and the thirty-five "below median" pupils under study, together with Fisher's "t" ratio derived from each comparison.

The criterion of reliability for the "significant difference" was established with reference to a "t" of 2.58 at one per cent level of confidence and seventy degrees of freedom.[1]

The summation, conclusions, implications, and recommendations stemming from the interpretation of the data are reserved for inclusion in the final chapter of this study.

Age Levels

Introduction.-- This section of the research report will present the analysis and interpretation of the data on the observed differences in the chronological ages between the "above median" and "below median" groups of seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957.

Chronological Ages of the Subjects.-- The data on the chronological ages of the two groups of subjects: those of the "above median" group and those of the "below median" group of seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 1 and 2 and Figure 1, and the following paragraphs.

Above Median Group.-- The data on the chronological ages in months of the "above median" group indicated a range of scores from a low of 128 to a high of 170, with a mean score of 153.9, a median score of 150.35, a standard deviation of 9.26, and a standard error of the mean of 1.6. The mean score of 153.9 months was equivalent to 13.5 years of age.

Ten or 28.6 per cent of the pupils scored above the mean class interval, nine or 26.6 per cent of them scored within the mean class interval, and 16 or 42.8 per cent of the pupils scored below the mean class interval.

TABLE 1

DISTRIBUTION OF THE CHRONOLOGICAL AGES OF THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL MARIETTA, GEORGIA, 1956-1957

Ages in Months	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
195-200			1	2.86	1	1.43
190-194			1	2.86	1	1.43
185-189						
180-184			5	14.30	5	7.15
175-179			3	8.58	3	4.29
170-174	1	2.86	5	14.30	6	8.58
165-169	1	2.86			1	1.43
160-164	2	5.72	8	22.88	10	14.30
155-159	6	17.16	5	14.30	11	15.63
150-154	9	25.74	4	11.44	13	18.59
145-149	8	22.88	2	5.72	10	14.30
140-144	3	8.58			3	4.29
135-139	3	8.58	1	2.86	4	5.72
130-134	1	2.86			1	1.43
125-129	1	2.86			1	1.43
Total	35	100.00	35	100.00	70	100.00
Range	46		64		71	
Mean	153.9		166		159	
Median	150.35		163		157.25	
S.D.	9.27		15.56		13.09	
$S.E._m$	1.6		2.7		2.35	

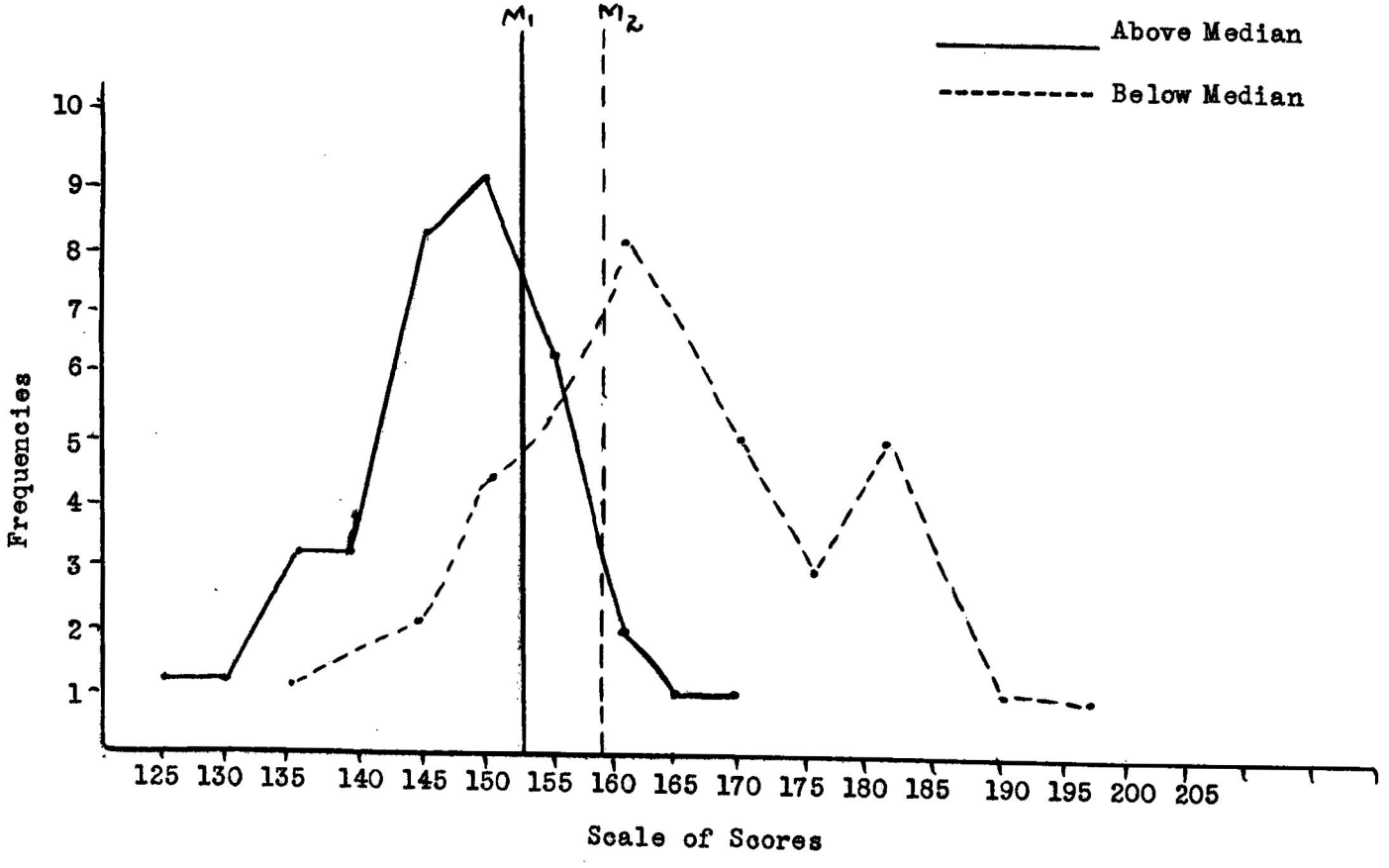

Fig. 1.-- Frequency Polygon of the Chronological Ages of the Thirty-Five "Above Median" and the Thirty-five "below Median" Pupils of the Lemon Street School, Marietta, Georgia, 1956-57.

Below Median Group.-- The data on the chronological ages (in months) of the "below median" group indicated a range of scores from a low of 135 to a high of 199, with a mean score of 166, a median score of 163, a standard deviation of 15.56, and a standard error of the mean of 2.7. The mean score of 166 months was equivalent to 16.5 years of age.

Fifteen or 43 per cent of the pupils scored above the mean class interval, nine or 25.74 per cent of them scored within the mean class interval, and 20 or 57 per cent scored below the mean class interval.

Comparative Data and "t" Ratio.-- Table 2 shows that the means for the "above median" group was 153.9, for the "below median" group 166, with a difference of 12.1. The median for the "above median" group was 150.35, for the "below median" group 163, with a difference of 6.29. The standard error of the mean for the "above median" group was 1.6, for the "below median" group 2.7, with a difference of 1.1. The standard error of the difference between the two means was 2.07.

The "t" of 5.8 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference in the ages of the "above median" group and the "below median" group was statistically significant.

Intelligence Levels

Introduction.-- The primary concern of this section of the research report will be the presentation of the analysis and interpretation of the data on the observed differences in the intelligence or mental maturity between the "above median" and "below median" groups of seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957. The data are treated with reference to the raw scores in terms of months and their I. Q. equivalents, respectively.

TABLE 2

COMPARATIVE DATA FOR THE CHRONOLOGICAL AGES OF THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-1957

Group	Mean	Median	S.D.	$S.E._m$	M_1-M_2	$S.E.diff._m$	"t"
"Above Median"	152.9	150.35	9.27	1.6	12.1	2.07	5.8
"Below Median"	166	163	15.56	2.7			

Results on the Otis Quick-Scoring Mental Ability Test (Raw Scores).-- The data on the total score component of the Otis Quick-Scoring Mental Ability Test as obtained by the scores of thirty-five "above median" and thirty-five "below median" seventh grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Table 3 and Figure 2.

Above Median Group.-- The raw scores obtained by the "above median" pupils ranged from a high of 45 to a low of 21. The mean score was 29.2, the median 28.15, with a standard devation of 3.61, and a standard error of the mean of 9.62.

Twelve or 34 per cent of the pupils scored above the mean class interval, 11 or 32 per cent of them scored within the mean class interval, and 12 or 34 per cent of them scored below the mean class interval. The mean score of 29.2 is equivalent to a mental age norm of eleven years and one month.

Below Median Group.-- The raw scores obtained by the "below median" pupils ranged from a high of 21 to a low of 5, showing a mean score of 14.2, a median score of 12.44, with a standard deviation of 4.45, and a standard error of the mean of .783.

TABLE 3

DISTRIBUTION OF THE RAW SCORES ON THE OTIS QUICK-SCORING MENTAL ABILITY TEST (TOTAL FACTORS) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

	Above Median		Below Median		Total	
Scores	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
45-47	1	2.86			1	1.43
42-44						
39-41	2	5.72			2	2.86
36-38	2	5.72			2	2.86
33-35	2	5.72			2	2.86
30-32	5	14.30			5	7.15
27-29	11	31.46			11	15.73
24-26	9	25.74			9	12.87
21-23	3	8.58	1	2.86	4	5.72
18-20			8	22.88	8	11.44
15-17			8	22.88	8	11.44
12-14			8	22.88	8	11.44
9-11			8	22.88	8	11.44
6-8			1	2.86	1	1.43
3-5			1	2.86	1	1.43
Total	35	100.00	35	100.00	70	100.00
Mean	29.2		14.2		21.7	
Median	28.15		12.44		21.25	
S.D.	5.61		4.45		9.34	
$S.E._m$	.962		.783		1.12	
I. Q.	91.17		68.97			

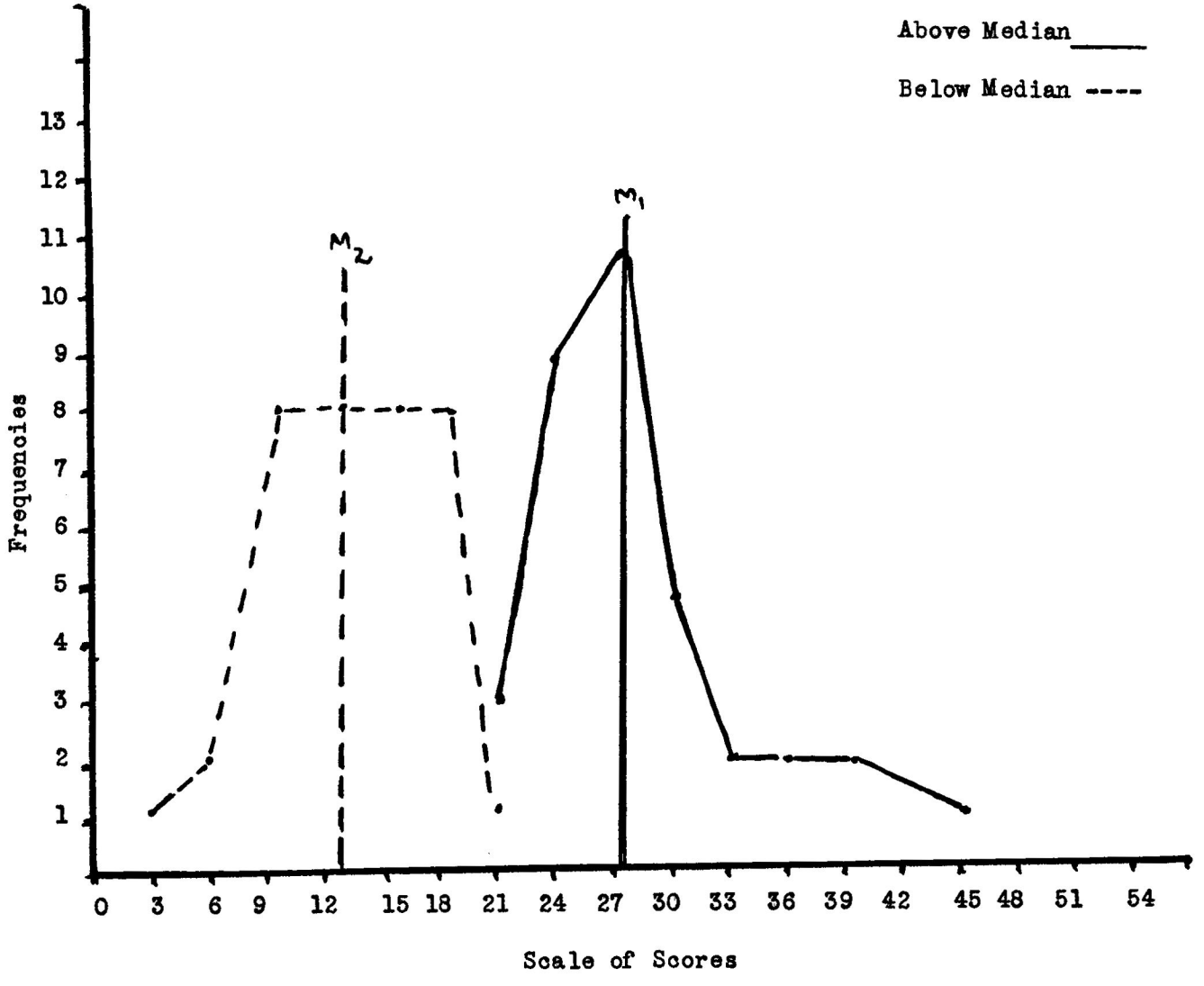

Fig. 2.-- Frequency Polygon of Raw Scores for Total Mental Factors Obtained on the Otis Quick-Scoring Mental Ability Test, Form E.M. by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, Marietta, Georgia, 1956-1957.

Seventeen or 48.62 per cent of the pupils scored above the mean class interval, eight or 22.86 per cent of the pupils scored within the mean class interval, and 10 or 28.86 per cent of them scored below the mean class interval. The mean score of 14.2 is equivalent to a mental age norm of nine years.

Comparative Data and "t" Ratio.-- Table 4 shows that the mean for the "above median" group was 29.2, for the "below median" group 14.2, with a difference of 15. The median for the "above median" group was 28.15, for the "below median" group 12.55, with a difference of 15.71. The standard deviation for the "above median" group was 5.61, for the "below median" group 4.45, with a difference of 1.16. The standard error of the mean for the "above median" group was .962, for the "below median" group .783, with a difference of .179. The standard error of the difference between the two means was 1.25.

The "t" of 10.2 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" and the "below median" groups on the total score component of the Otis Quick-Scoring Mental Ability Test was statistically significant.

The Results of the Otis Quick-Scoring Mental Ability Test (Beta: Form E.M.) in Terms of Beta I.Q.'s.-- The data on the total score component of the Otis Quick-Scoring Mental Ability Test in terms of Beta I. Q.'s as derived from the raw scores by the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, are presented in Tables 5 and 6 and Figure 3.

Above Median Group.-- The I. Q.'s of the thirty-five "above median" pupils ranged from a high of 108 to a low of 79, to show a mean score of 19.17, a median score of 10.25, with a standard deviation of 6.62, and a

TABLE 4

COMPARATIVE DATA FOR TOTAL MENTAL FACTORS OBTAINED ON THE OTIS QUICK-SCORING MENTAL ABILITY TEST BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA 1956-1957

Group	Means	Median	S. D.	S. $E._m$	$M_1 - M_2$	S.E.$diff_m$	"t"
"Above Median"	29.2	28.15	5.61	.962	15	1.25	10.2
"Below Median"	14.2	12.44	4.45	.783			

standard error of the mean of 1.18.

Thirteen or 37.18 per cent of the pupils scored above the mean class interval, six or 17.16 per cent of them scored within the mean class interval, and 16 or 45.76 per cent or them scored below the mean class interval. The mean I. Q. of 91.17, indicates that this group falls in the low-normal bracket of intelligence.

Below Median Group.-- The I. Q.'s of the thirty-five "below median" pupils ranged from a high of 79 to a low of 54, to show a mean score of 68.9, a median score of 69.57, with a standard deviation of 6.32, and a standard error of the mean of 1.08.

Thirteen or 37.18 per cent of the pupils scored above the mean class interval, seven or 20.02 per cent of them scored within the mean class interval, and 15 or 42.9 per cent scored below the mean class interval. The mean I. Q. of 68.97 indicates that this group is mentally deficient.

Comparative Data and "t" Ratio.-- Table 6 shows that the mean for the "above median" group was 91.17, for the "below median" group 68.97, with a difference of 22.20. The median for the "above median" group was 90.25, for the "below median" group 69.57, with a difference of 20.68. The standard deviation for the "above median" group was 6.62, for the "below

TABLE 5

DISTRIBUTION OF THE RAW SCORES ON THE OTIS QUICK-SCORING MENTAL ABILITY TEST (BETA I.Q.'S) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-1957

	Above Median		Below Median		Total	
Scores	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
108-110	1	2.86			1	1.43
105-107	1	2.86			1	1.43
102-104	1	2.86			1	1.43
99-101	1	2.86			1	1.43
96-98	3	8.58			3	4.29
93-95	6	17.16			6	8.58
90-94	6	17.16			6	8.58
87-89	9	25.74			9	12.87
84-86	3	8.58			3	4.29
81-83	3	8.58			3	4.29
78-80	1	2.86	2	5.72	3	4.29
75-77			5	14.30	5	7.15
72-74			6	17.16	6	8.58
69-71			7	20.02	7	10.01
66-68			5	14.30	5	7.15
63-65			4	11.44	4	5.72
60-62			4	11.44	4	5.72
57-59			1	2.86	1	1.43
54-56			1	2.86	1	1.43
Total	35	100.00	35	100.00	70	100.00
Mean		91.17		68.97		80.5
Median		90.25		69.57		70.6
S.D.		6.62		6.32		12.63
S.E.m		1.18		1.08		1.5
I.Q.		91.17		68.97		

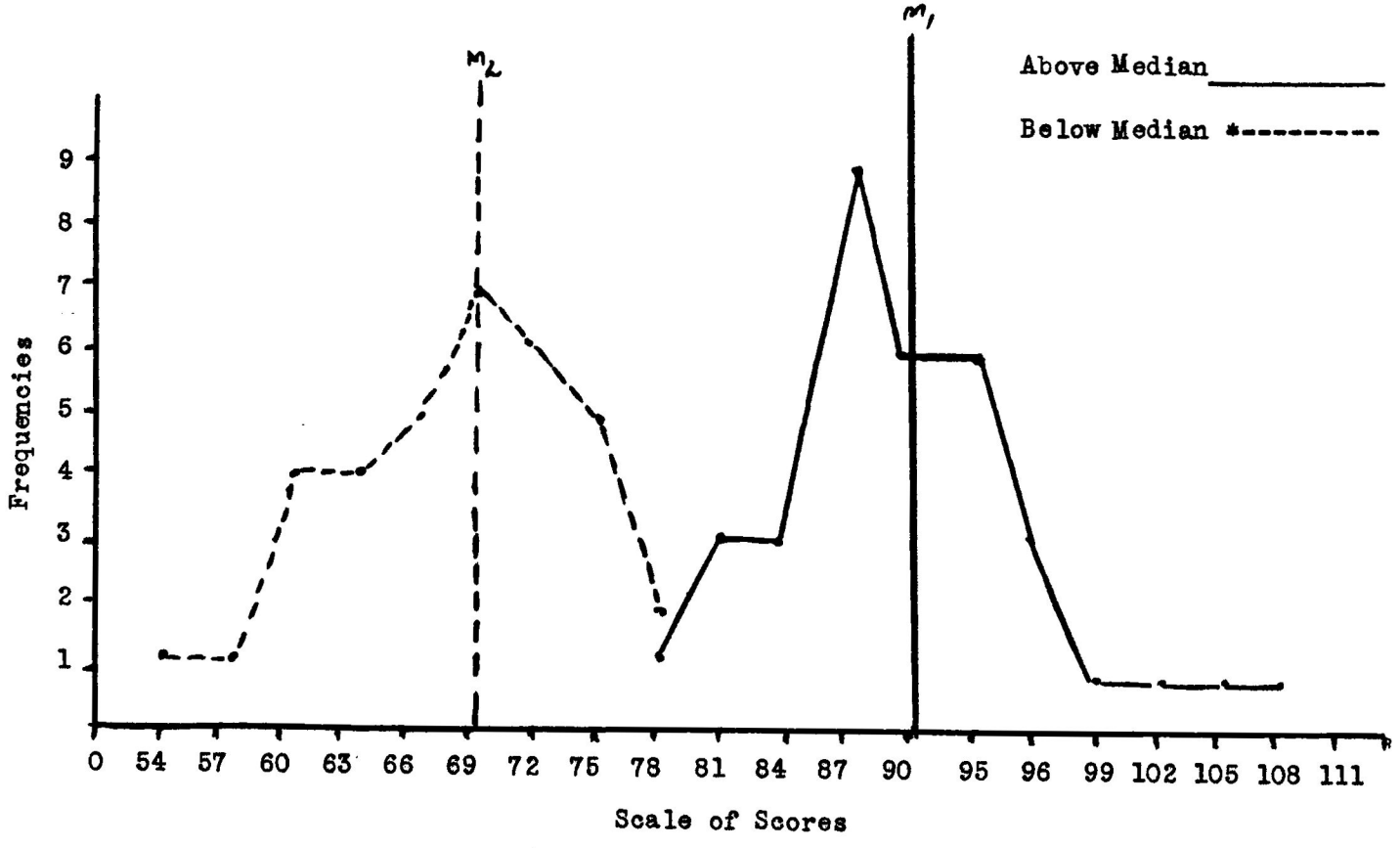

Fig. 3.-- Frequency Polygon of Raw Scores for the Computed Beta I. Q.'s Obtained from Scores Made on the Otis Quick-Scoring Mental Ability Test by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-1957.

TABLE 6

COMPARATIVE DATA FOR BETA I.Qs. DERIVED FROM THE RAW SCORES MADE ON THE OTIS QUICK-SCORING MENTAL ABILITY TEST BY THIRTY-FIVE ABOVE MEDIAN AND THIRTY-FIVE BELOW MEDIAN PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-1957

Group	Means	Median	S. D.	S.E.m	$M_1 - M_2$	S.E.diff$_m$	"t"
"Above Median"	91.17	90.26	6.62	1.18	22.20	1.592	13.9
"Below Median"	68.97	69.57	6.32	1.08			

median" group 6.32, with a difference of .30. The standard error of the mean for the "above median" group was 1.18, for the "below median" group 1.08, with a difference of .10. The standard error of the difference between the two means was 1.592.

The "t" of 13.9 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference of the I. Q.'s between the "above median" and the "below median" groups was statistically different.

Achievement Levels

Introduction.-- The third section of this research report will present the analysis and interpretation of the data on the observed differences in school accomplishment, with reference to standardized test-scores, between the "above median" and "below median" groups of seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957. The data are treated with reference to the raw scores, together with their grade-placement indices, and the Fisher's "t" ratio.

Results of the General Achievement Test (Average Score, Total Factors).-- The data on the average scores, total factors, of the General Achievement Test as obtained by scores of the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils in the Lemon Street School, Marietta, Georgia, 1956-57 are presented in Tables 7 and 8 and Figure 4.

Above Median Group.-- The scores of the thirty-five "above median" pupils of the seventh-grade ranged from a high of 79 to a low of 46, to show a mean score of 58.78, a median score of 56, with a standard deviation of 9.38, and a standard error of the mean of 1.6.

Fourteen or 40.04 per cent of the pupils scored above the mean class interval, three or 8.58 per cent of them scored within the mean class interval, and 18 or 51.48 per cent of them scored below the mean class interval. The mean score of 58.78 is equivalent to a grade placement of 5.6.

Below Median Group.-- The scores of the thirty-five "below median" pupils of the seventh-grade ranged from a high of 60 to a low of 41, showing a mean score of 48.22, a median score of 47.05, with a standard deviation of 5.116, and a standard error of the mean of .88.

Eight or 22.88 per cent of the pupils scored above the mean class interval, seven or 20.02 per cent of them scored within the mean class interval, and 19 or 56.34 per cent of them scored below the mean class interval. The mean score of 48.22 was equivalent to a grade placement of 4.5.

Comparative Data and "t" Ratio.-- Table 8 shows that the mean for the "above median" group was 58.78, for the "below median" group 48.22, with a difference of 10.56. The median for the "above median" group was 56, for the "below median" group 47.05, with a difference of 8.95. The standard

TABLE 7

DISTRIBUTION OF THE RAW SCORES ON THE GRAY-VOTAW-ROGERS GENERAL ACHIEVEMENT TEST (TOTAL AVERAGE SCORES) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-1957

	Above Median		Below Median		Total	
Scores	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
78-80	1	2.86			1	1.43
75-77	2	5.72			2	2.86
72-74						
69-71	2	5.72			2	2.86
66-68	2	5.72			2	2.86
63-65	3	8.58			3	4.29
60-62	4	11.44	2	5.72	6	8.58
57-59	3	8.58	1	2.86	4	5.72
54-47	6	17.16	3	8.58	9	12.87
51-53	9	25.74	3	8.58	12	17.16
48-50	2	5.72	7	20.02	9	12.87
45-47	1	2.86	10	28.60	11	15.73
42-44			8	22.88	8	11.44
39-41			1	2.86	1	1.43
Total	35	100.00	35	100.00	70	100.00
Mean	58.78		48.22		54.4	
Median	56		47.05		51	
S.D.	9.384		5.116		8.535	
S.E.m	1.6		.88		1.02	
G.P.	5.6		4.5			

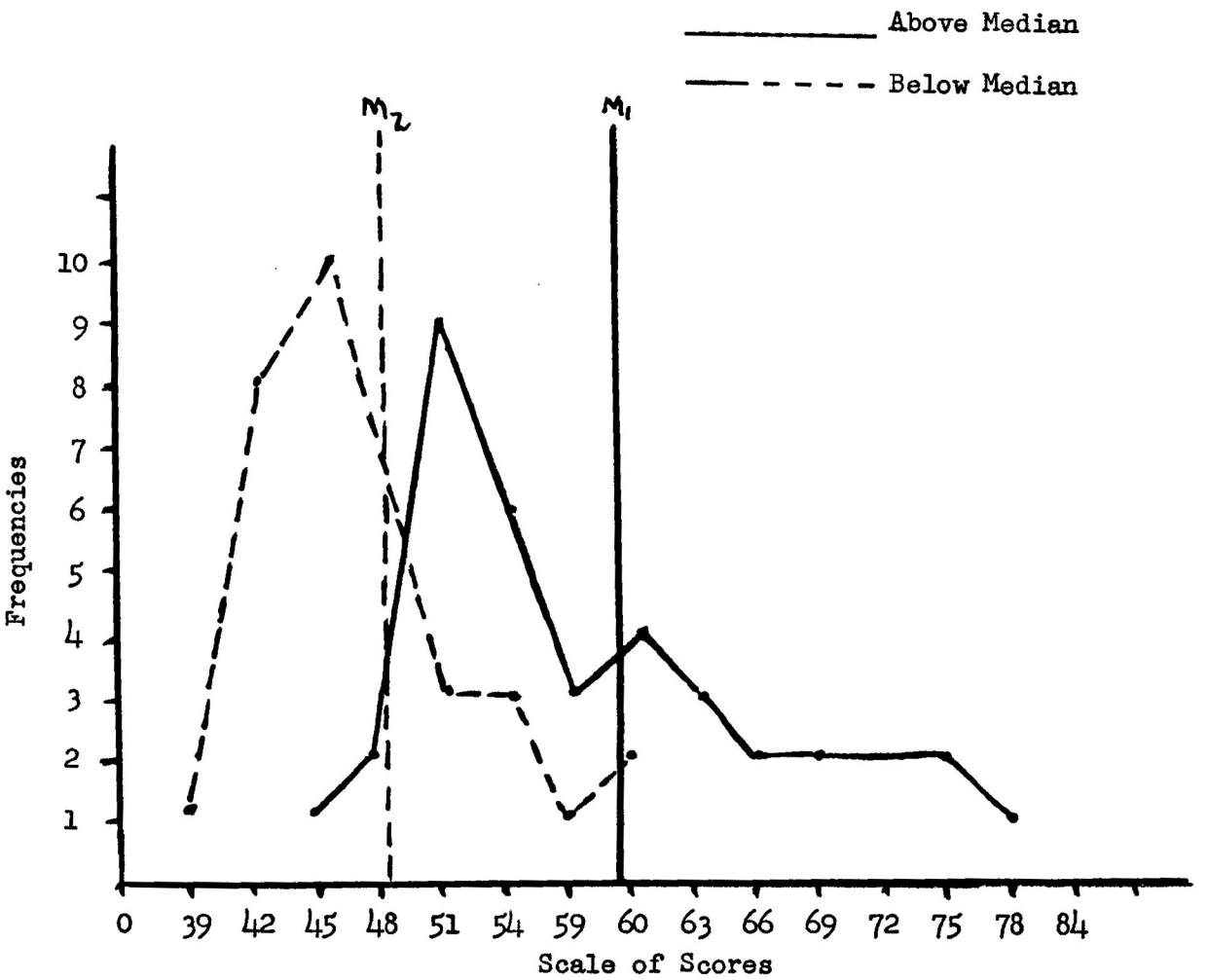

Fig. 4.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Total Factors) by Thirty-Five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57

TABLE 8

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GRAY-VOTAW-ROGERS GENERAL ACHIEVEMENT TEST (TOTAL AVERAGE SCORES) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-1957

Group	Means	Median	S. D.	S.E.$_m$	$M_1 - M_2$	S.E.diff$_m$	"t"
"Above Median"	58.78	56	9.384	1.6	10.56	1.814	6
"Below Median"	48.22	47.05	5.116	.88			

deviation for the "above median" group was 9.384, for the "below median" group 5.116, with a difference of 4.268. The standard error of the mean for the "above median" group was 1.6, for the "below median" group .88, with a difference of .78. The standard error of the difference between the two means was 1.814.

The "t" of 6 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" group and the "below median" group on the total average scores on the General Achievement Test was statistically significant.

Results on the General Achievement Test (Elementary Science).-- The data on the total score component of the General Achievement Test (Elementary Science) as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 9 and 10 and Figure 5.

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 90 to a low of 40 to show a mean score of 51.4, a median score of 43.75, with a standard deviation of 15.34, and a standard error of the mean of 2.6.

TABLE 9

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (ELEMENTARY SCIENCE) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-1957

	Above Median		Below Median		Total	
Scores	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
90-92	1	2.86			1	1.43
87-89						
84-86	1	2.86			1	1.43
81-83						
78-80	1	2.86			1.	1.43
75-77						
72-74	1	2.86			1	1.43
69-71	3	8.58			3	4.29
66-68			1	2.86	1	1.43
63-65						
60-62			1	2.86	1	1.43
57-59	2	5.72			2	2.86
54-56	4	11.44			4	5.72
51-53	2	5.72			2	2.86
48-50	1	2.86	4	11.44	5	7.15
45-47	1	2.86			1	1.43
42-44	2	5.72	1	2.86	3	4.29
29-41	16	45.76	28	80.08	44	64.92
Total	35	100.00	35	100.00	70	100.00
Median	51.4		42.49		48.15	
Mean	43.75		40		40.87	
S.D.	15.34		6.48		11.97	
S.E.m	2.6		1.1		1.3	
G. P.	4.7		3.9			

Thirteen or 37.18 per cent of the pupils scored above the mean class interval, two or 5.72 per cent of them scored within the mean class interval, and 20 or 57 per cent of them scored below the mean class interval. The mean score of 51.4 is equivalent to a grade placement of 4.7.

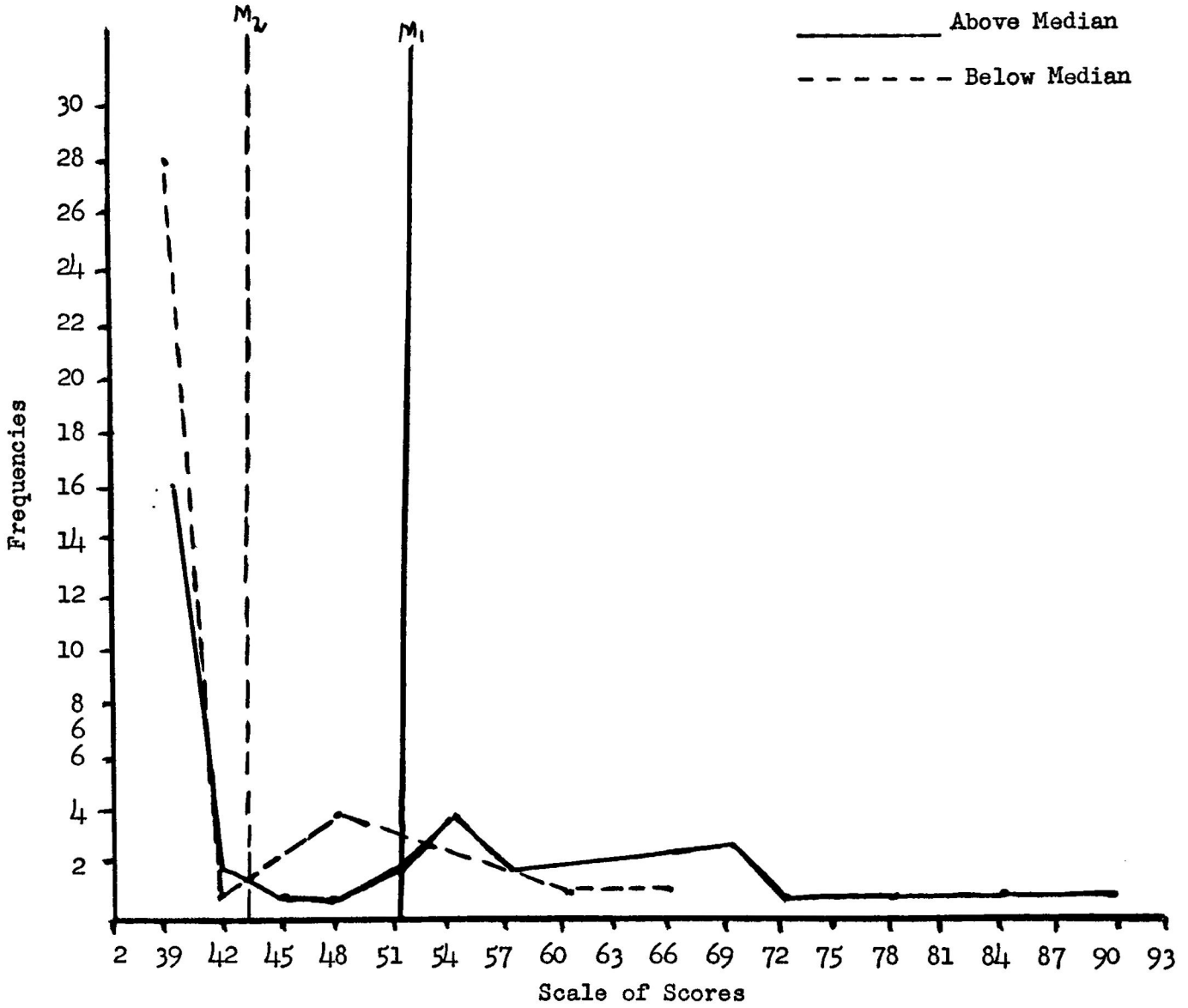

Fig. 5.— Frequency Polygon of Raw Scores Made on the General Achievement Test by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

Below Median Group.-- The scores of the thirty-five "below median" pupils ranged from a high of 66 to a low of 40, to show a mean score of 42.49, a median score of 40, with a standard deviation of 6.48, and a standard error of the mean of 1.1.

Six or 17.16 per cent of the pupils scored above the mean class interval, one or 2.86 per cent of them scored within the mean class interval, and 28 or 80.08 per cent of them scored below the mean class interval. The mean score of 42.49 is equivalent to a grade placement of 3.9.

Comparative data and "t" Ratio.-- Table 10 shows that the mean for the "above median" group was 51.4, for the "below median" group 42.49, with a difference of 8.91. The median for the "above median" group was 43.75, for the "below median" group 40, with a difference of 3.75. The standard deviation for the "above median" group was 15.74, for the "below median" group 6.48, with a difference of 9.26. The standard error of the mean for the "above median" group was 2.6, for the "below median" group 1.1, with a difference of 1.5. The standard error of the difference between the two means was 2.82.

The "t" of 3.16 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" group and the "below median" group on the component of Elementary Science was statistically significant.

Results of the General Achievement Test (Language Factor).-- The data on the total score component of the General Achievement Test as obtained by the scores of thirty-five "above median" and thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 11 and 12 and Figure 6.

TABLE 10

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (ELEMENTARY SCIENCE FACTOR) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA 1956-57

Group	Means	Median	S. D.	S. E.$_m$	$M_1 - M_2$	S.E.diff$_m$	"t"
"Above Median"	51.4	43.75	15.74	2.6	8.91	2.82	3.16
"Below Median"	42.49	40	6.48	1.1			

Above Median Group.-- The scores of the thirty-five "above median" pupils enrolled in the seventh grade of the Lemon Street School, ranged from a high of 88 to a low of 36, to show a mean score of 62.2, a median score of 65, with a standard deviation of 13.02, and a standard error of the mean of 2.23.

Twenty or 57 per cent of the pupils scored above the mean class interval, three or 8.58 per cent of them scored within the mean class interval, and 12 or 34.32 per cent of them scored below the mean class interval. The mean score of 62.2 was equivalent to a grade-placement of 5.9.

Below Median Group.-- The scores of the thirty-five "below median" pupils ranged from a high of 88 to a low of 36 to show a mean score of 52.69, a median score of 43, with a standard deviation of 17.25, and a standard error of the mean of 2.99.

Twelve or 34.32 per cent of the pupils scored above the mean class interval, two or 5.72 per cent of them scored within the mean class interval, and 20 or 60.06 per cent of them scored below the mean class interval. The mean score of 52.69 was equivalent to a grade-placement of 4.8.

Comparative Data and "t" Ratio.-- Table 12 shows that the mean for the

TABLE 11

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (LANGUAGE) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Scores	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
87-89	1	2.86	1	2.86	2	2.86
84-86						
81-83						
78-80	2	5.72	2	5.72	4	5.72
75-77	3	8.58			3	4.29
72-74	2	5.72			2	2.86
69-71	4	11.44			4	5.72
66-68	5	14.30	6	17.16	11	15.73
63-65	3	8.58			3	4.29
60-62	3	8.58	2	5.72	5	7.15
57-59	1	2.86			1	1.43
54-56	3	8.58	1	2.86	4	5.72
51-53	1	2.86	2	5.72	3	4.29
48-50	1	2.86	2.	5.72	3	4.29
45-47	1	2.86			1	1.43
42-44			3	8.58	3	4.29
39-41	3	8.58	2	5.72	5	7.15
36-38	2	5.72	14	40.04	16	22.88
Total	35	100.00	35	100.00	70	100.00
Mean	62.2		52.69		57.54	
Median	65		43		56.76	
S.D.	13.02		14.65		14.835	
S.E.m	2.23		2.6		1.79	
G. P.	5.9		4.8			

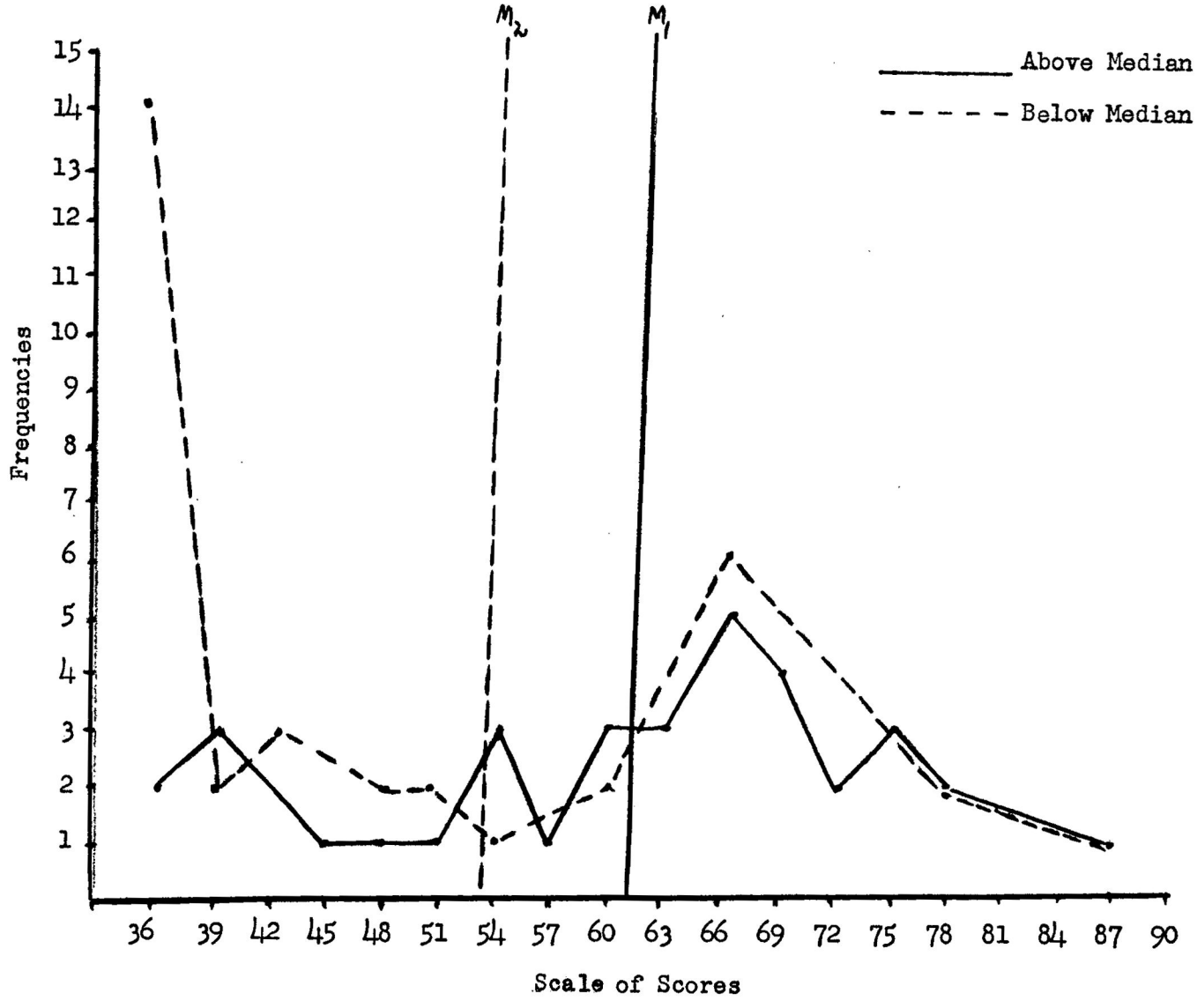

Fig. 6.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Language Factor) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 12

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (LANGUAGE FACTOR) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57.

Group	Means	Median	S. D.	S.E.m	M_1-M_2	S.E.diff.$_m$	"t"
"Above Median"	62.2	65	13.02	2.23	9.51	3.35	2.83
"Below Median"	52.69	43	14.65	2.5			

mean for the "above median" group was 62.2, for the "below median" group 52.69, with a difference of 9.51. The median for the "above median" group was 65, for the "below median" group 43, with a difference of 22. The standard deviation for the "above median" group was 13.02, for the "below median" group 14.65, with a difference of 1.63 in favor of the "below median" group. The standard error of the mean for the "above median" group was 2.23, for the "below median" group 2.5, with a difference of .27, in favor of the "below median" group. The standard error of the difference between the two means was 3.35.

The "t" of 2.83 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" group and the "below median" group on the component of Language was statistically significant.

Results of the General Achievement Test (Literature Factor).-- The data on the Literature factor of the General Achievement Test as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia are presented in Tables 13 and 14 and Figure 7.

TABLE 13

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (LITERATURE) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Scores	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
90-92	2	2.86			2	1.43
87-89						
84-86	1	2.86			1	1.43
81-83	2	5.72	1	2.86	3	4.29
78-80	1	2.86			1	1.43
75-77			1	2.86	1	1.43
72-74	1	2.86			1	1.43
69-71	3	8.58	3	8.58	6	8.58
66-68						
63-65	2	5.72	1	2.86	3	4.29
60-62	4	11.44	2	5.72	6	8.58
57-59	4	11.44	2	5.72	6	8.58
54-56	3	8.58	3	8.58	6	8.58
51-53	5	14.30	4	11.44	9	12.87
48-50						
45-47	4	11.44	4	11.44	8	11.44
42-44	3	8.58	13	37.18	16	22.88
39-41			1	2.86	1	1.43
Total	35	100.00	35	100.00	35	100.00
Mean	61		52.18		56.5	
Median	58.35		47.88		53.9	
S.D.	18		13.287		13.284	
S.E.m	3.09		2.3		1.6	
G. P.	5.8		4.8			

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 90 to a low of 44 to show a mean score of 61, a median score of 58.35, with a standard deviation of 18, and a standard error of the mean of 3.09.

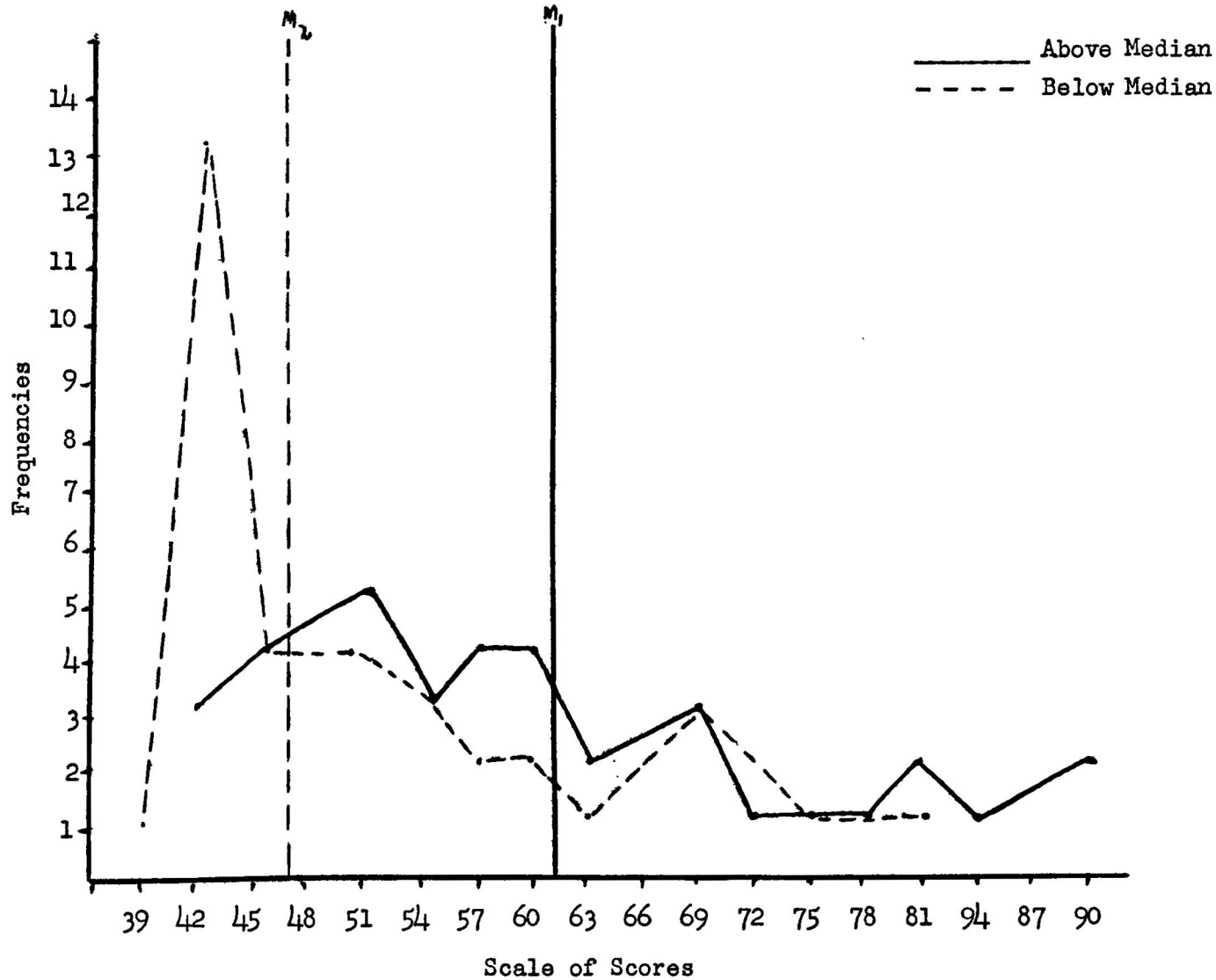

Fig. 7.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Literature Factor) by Thirty-five "Above Median" and Thirty-five "Below Median Pupils of the Lemon Street School, 1956-57.

Twelve or 35.34 per cent of the pupils scored above the mean class interval, four or 11.44 per cent of them scored within the mean class interval, and 17 or 48.62 per cent of them scored below the mean class interval. The mean score of 61 was equivalent to a grade-placement of 5.8.

Below Median Group.-- The scores of the thirty-five "below median" pupils ranged from a high of 81 to a low of 41, to show a mean score of 52.18, a median score of 47.88, with a standard deviation of 13.287, and a standard error of the mean of 2.3.

Thirteen or 37.18 per cent of the pupils scored above the mean class interval, four or 11.44 per cent of them scored within the mean class interval, and 18 or 51.48 per cent of them scored below the mean class interval. The mean score of 52.18 was equivalent to a grade-placement of 4.8.

Comparative Data and "t" Ratio.-- Table 14 shows that the mean for the "above median" group was 61, for the "below median" group 52.18, with a difference of 9.82. The median for the "above median" group was 58.35, for the "below median" group 47.88, with a difference of 10.47. The standard deviation for the "above median" group was 18, for the "below median" group 13.287, with a difference of 4.713. The standard error of the mean for the "above median" group was 3.09, for the "below median" group 2.3, with a difference of .79. The standard error of the difference between the two means was 3.852.

The "t" of 2.3 was not significant in that it was smaller than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" and the "below median" pupils on the component of literature was not statistically significant.

TABLE 14

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (LITERATURE FACTOR) BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	S. E.m	M_1-M_2	S.E. diffm	"t"
"Above Median"	61	58.35	18	3.09	8.82	3.852	2.3
"Below Median"	52.18	47.27	13.29	2.3			

Results of the General Achievement Test (Spelling Factor).-- The data on the Spelling factor of the General Achievement Test as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957 are presented in Tables 15 and 16 and Figure 8.

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 88 to a low of 45, to show a mean score of 68.2, a median score of 67.1, with a standard deviation of 1.98, and a standard error of the mean of 2.79.

Fifteen or 42.9 per cent of the pupils scored above the mean class interval, five or 14.30 per cent scored within the mean class interval, and thirteen or 37.18 per cent of them scored below the mean class interval. The mean score of 68.2 was equivalent to a grade-placement of 6.8.

Below-Median Group.-- The scores of the thirty-five "below median" pupils ranged from a high of 82 to a low of 41, to show a mean score of 55.3, a median score of 52.5, with a standard deviation of 11.43, and a standard error of the mean of 1.97.

Sixteen or 45.76 per cent of the pupils scored above the mean class interval, four or 11.44 per cent of them scored within the mean class

TABLE 15

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (SPELLING) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Scores	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
87-89	3	8.58			3	4.29
84-86	1	2.86			1	1.43
81-83			1	2.86	1	1.43
78-80	4	11.44	1	2.86	5	7.15
75-77	4	11.44			4	5.72
72-74	2	5.72	2	5.72	4	5.72
69-71	1	2.86	2	5.72	3	4.29
66-68	5	14.30	1	2.86	6	8.58
63-65	3	8.58	3	8.58	6	8.58
60-62	1	2.86	3	8.58	4	5.72
57-59	2	5.72			2	2.86
54-56	3	8.58	3	8.58	6	8.58
51-53			4	11.44	4	5.72
48-50	3	8.58	4	11.44	7	10.01
45-47	1	2.86	3	8.58	4	5.72
42-44			5	14.30	5	7.15
39-41			3	8.58	3	4.29
Total	35	100.00	35	100.00	70	100.00
Mean	68.2		55.3		61.48	
Median	67.1		52.5		52.5	
S.D.	11.56		11.43		13.203	
S.E.m	1.98		3.47		1.6	
G. P.	6.8		5.1			

interval, and 15 or 42.9 per cent of them scored below the mean class interval. The mean score of 55.3 was equivalent to a grade-placement of 5.1.

Comparative Data and "t" Ratio.-- Table 16 shows that the mean for the "above median" group was 68.2, for the "below median" group 55.3, with a difference of 12.9. The median for the "above median" group was 67.1, for the "below median" group 52.5, with a difference of 14.6. The standard

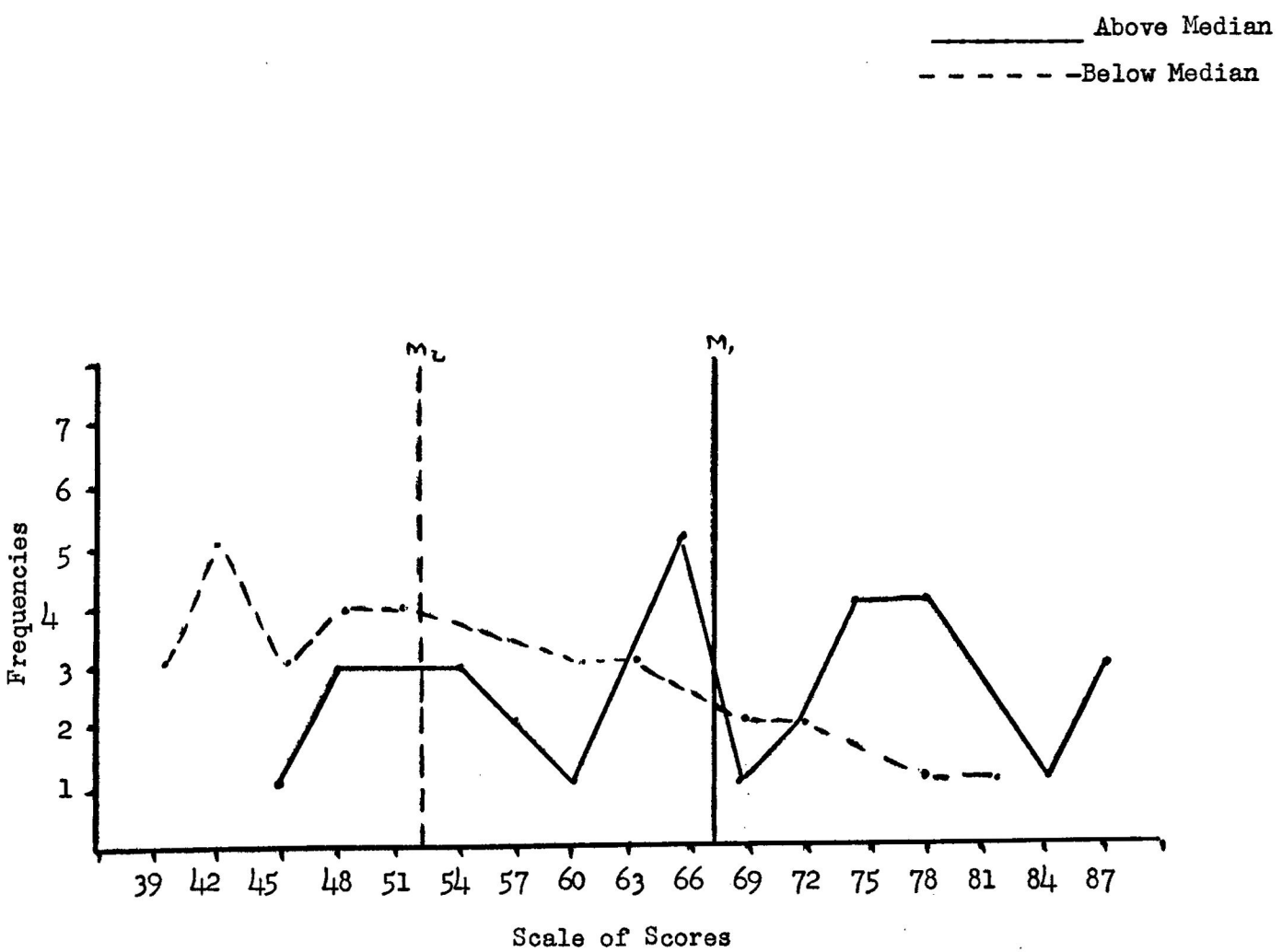

Fig. 8.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Spelling Factor) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 16

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (SPELLING FACTOR) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	S. E.m	$M_1 - M_2$	S.E.diffm	"t"
"Above Median"	68.2	67.1	11.556	1.98	12.9	2.792	4.6
"Below Median"	55.3	52.5	11.43				

deviation for the "above median" group was 11.56, for the "below median" group 11.43, with a difference of .13. The standard error of the mean for the "above median" group was 1.98, for the "below median" group 1.97, with a difference of .1. The standard error of the difference between the two means was 2.792.

The "t" of 4.6 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference on the Spelling component between the "above median" pupils and the "below median" pupils was statistically significant.

Results on the General Achievement Test (Reading Vocabulary).-- The data on the Reading Vocabulary factor of the General Achievement Test as obtained by the scores of thirty-five "above median" and thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, are presented in Tables 17 and 18 and Figure 9.

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 75 to a low of 41, to show a mean score of 59.2, a median score of 59.88, a standard deviation of 10.83, and a standard error of the mean of 1.9.

Eighteen or 51.48 per cent of the pupils scored above the mean class

TABLE 17

DISTRIBUTION OF RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (READING VOCABULARY) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Scores	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
75-77	1	2.86			1	1.43
72-74	2	5.72			2	2.86
69-71	4	11.44			4	5.72
66-68	2	5.72			2	2.86
63-65	5	14.30	1	2.86	6	8.58
60-62	4	11.44	2	5.72	6	8.58
57-59	6	17.16	5	14.30	11	15.73
54-56	2	5.72	1	2.86	3	4.29
51-53	1	2.86	1	2.86	2	2.86
48-50	2	5.72	3	8.58	5	7.15
45-47	2	5.72	2	5.72	4	5.72
42-44	1	2.86	4	11.44	5	7.15
39-41	3	8.58	16	45.76	19	27.17
Total	35	100.00	35	100.00	70	100.00
Mean	59.2		46.6		52.4	
Median	59.88		41.74		53.5	
S.D.	10.83		7.62		7.44	
S.E.m	1.9		1.3		.9	
G. P.	5.6		4.4			

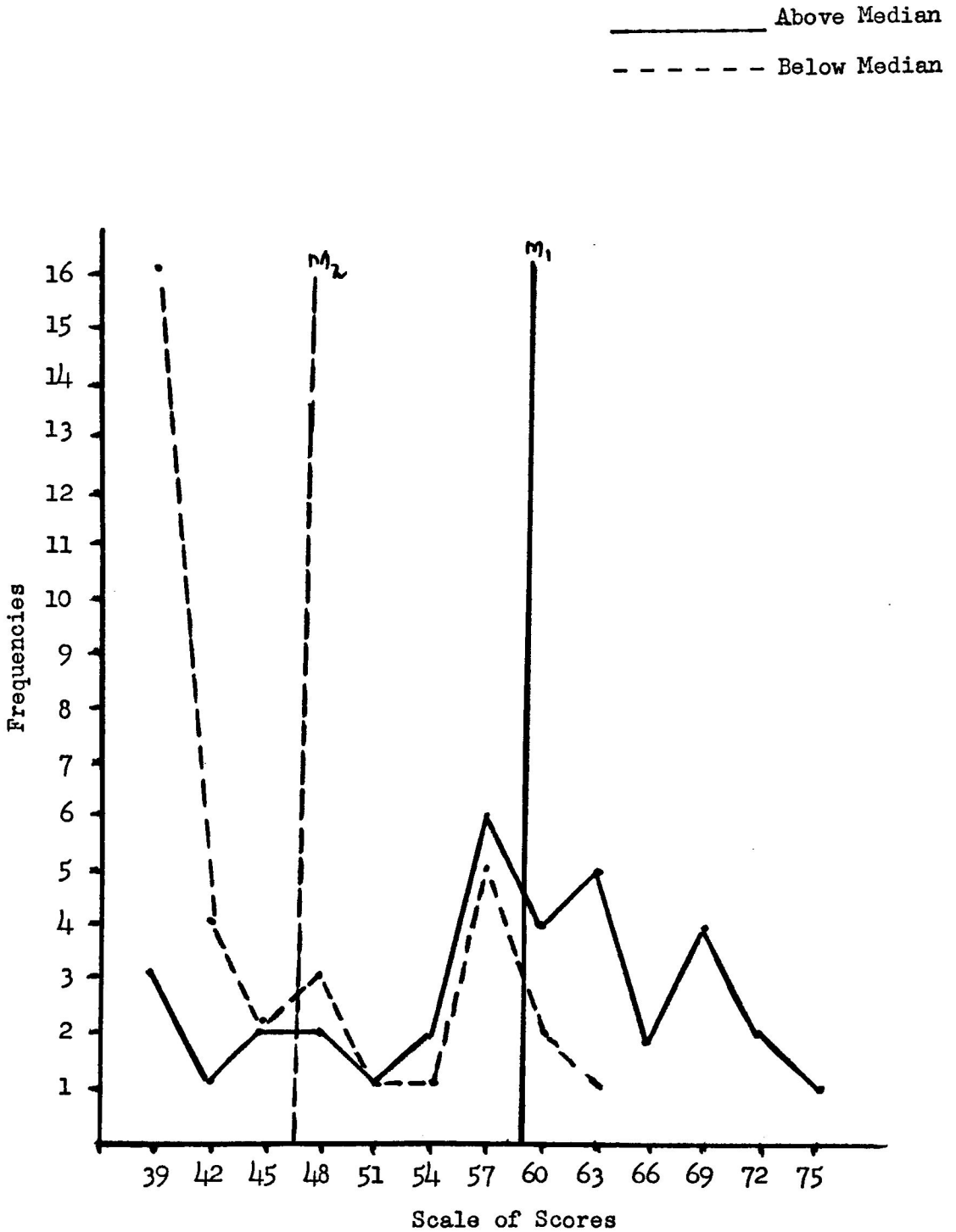

Fig. 9.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Reading Vocabulary Factor) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 18

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (READING VOCABULARY FACTOR) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	S.E.m	M_1-M_2	S.E. $diff_m$	"t"
"Above Median"	59.2	59.88	10.83	1.9	12.6	2.99	5.05
"Below Median"	46.6	44.71	7.62	1.3			

interval, six or 17.16 per cent of them scored within the mean class interval, and 11 or 31.46 per cent of them scored below the mean class interval. The mean score of 59.2 was equivalent to a grade-placement of 5.6.

Below Median Group.-- The scores of the thirty-five "below median" pupils ranged from a high of 63 to a low of 41, with a mean score of 46.6, a median score of 44.71, a standard deviation of 7.62, and a standard error of the mean of 1.3.

Thirteen or 38.7 per cent of the pupils scored above the mean class interval, two or 5.72 per cent of the pupils scored within the mean class interval, and 20 or 5.72 per cent of them scored below the mean class interval. The mean score of 46.6 was equivalent to a grade-placement of 4.4.

Comparative Data and "t" Ratio.-- Table 18 shows that the mean for the "above median" group was 59.2, for the "below median" group 46.6, with a difference of 12.6. The median for the "above median" group was 59.88, for the "below median" group 44.71, with a difference of 15.17. The standard deviation for the "above median" group was 10.83, for the "below median" group 7.62, with a difference of 3.21. The standard error of the mean for the "above median" group was 1.9, for the "below median" group 1.3, with a difference between the two means .6. The standard error of the difference between the two means was 2.99.

The "t" of 5.05 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" group and the "below median" group on the Reading Vocabulary Test was statistically significant.

Results of the General Achievement Test (Reading Comprehension).-- The data on the Reading Comprehension factor of the General Achievement Test as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 19 and 20 and Figure 10.

Above Median Group.-- The score of the thirty-five "above median" pupils ranged from a high of 85 to a low of 40, to show a mean score of 63.79, a median score of 62.68, with a standard deviation of 11.7, and a standard error of the mean of 2.

Nine or 25.74 per cent of the pupils scored above the mean class interval, nine or 25.74 per cent of the pupils scored within the mean class interval, and 17 or 49.06 per cent of them scored below the mean class interval. The mean score of 63.79 is equivalent to a grade-placement of 6.2.

Below Median Group.-- The scores of the thirty-five "below median" pupils ranged from a high of 55 to a low of 40, to show a mean score of 48.4, a median score of 44.53, with a standard deviation of 8.826, and a standard error of the mean of 1.5.

Thirteen or 37.18 per cent of the pupils scored above the mean class interval, none of them scored within the mean class interval, and 22 or 62.92 per cent of them scored below the mean class interval. The mean score of 48.4 was equivalent to a grade-placement of 4.5.

Comparative data and "t" Ratio.-- Table 20 shows that the mean for "above median" group was 63.79, for the "below median" group 48.4, with a

TABLE 19

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (READING COMPREHENSION FACTOR) AS OBTAINED BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Scores	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
84-86	4	11.44			4	5.72
81-83	1	2.86			1	1.43
78-80						
75-77	1	2.86			1	1.43
72-74						
69-71			1	2.86	1	1.43
66-68	3	8.58			3	4.29
63-65	9	25.74	3	8.58	12	17.16
60-62	2	5.72			2	2.86
57-59	1	2.86	4	11.44	5	7.15
54-56	4	11.44	4	11.44	8	11.44
51-53			1	2.86	1	1.43
48-50						
45-47	5	14.30	5	14.30	10	14.30
42-44	2	5.72	6	17.16	8	11.44
39-41	3	8.58	11	31.46	14	20.02
Total	35	100.00	35	100.00	70	100.00
Mean	63.79		48.4		53	
Median	62.68		44.53		54.25	
S.D.	11.7		8.826		13.32	
S.E.m	2		1.5		1.6	
G. P.	6.2		4.5			

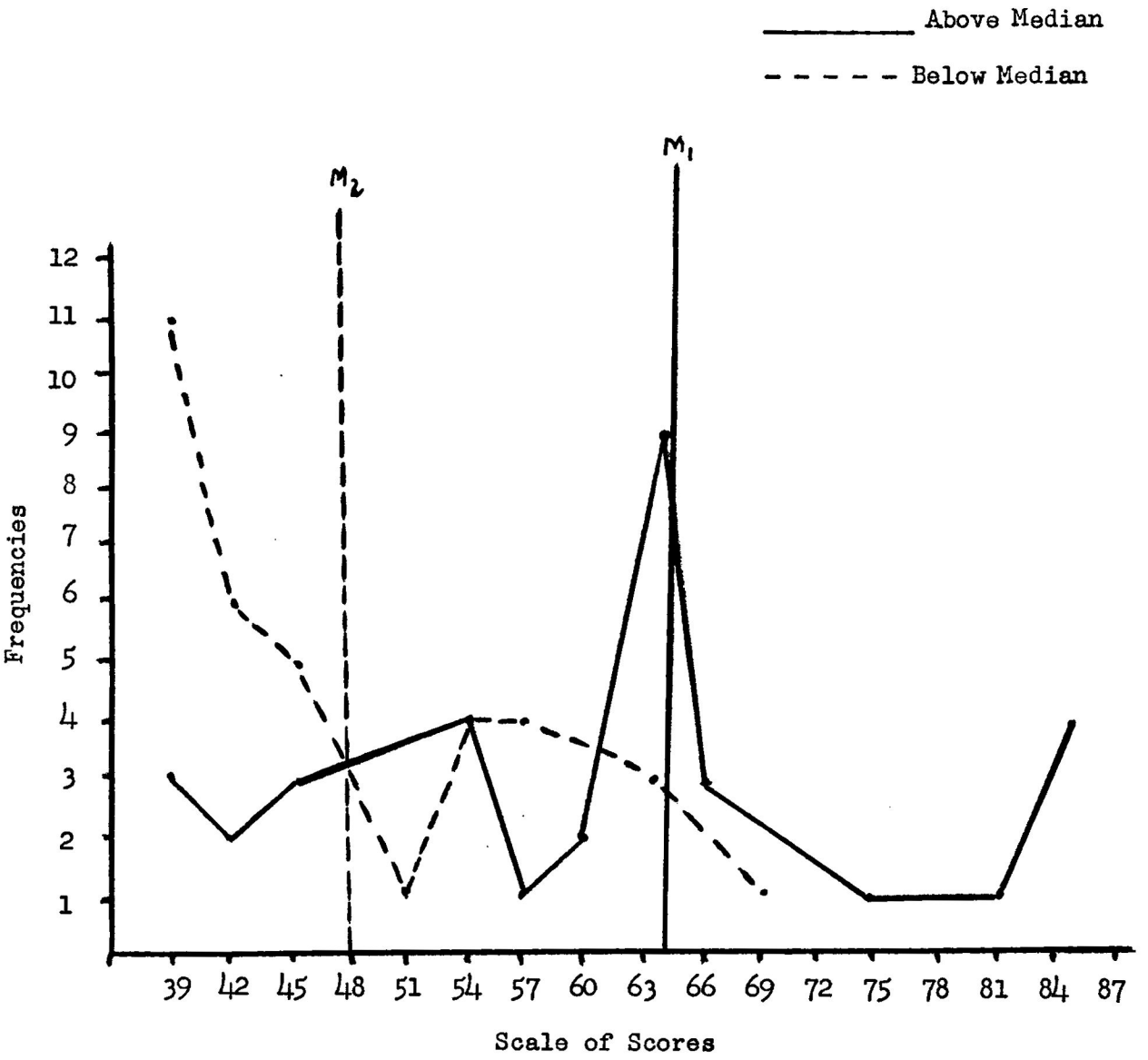

Fig. 10.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Reading Comprehension) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 20

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (READING COMPREHENSION) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	$S.E._m$	M_1-M_2	$S.E._{diff_m}$	"t"
"Above Median"	63.79	62.68	11.7	2	15.39	2.498	6.2
"Below Median"	48.4	44.53	8.826	1.5			

a difference of 19.39, The median for the "above median" group was 62.68, for the "below median" group 44.53, with a difference of 18.15. The standard deviation for the "above median" group was 11.7, for the "below median" group 8.826, with a difference of 2.874. The standard error of the mean for the "above median" group was 2, for the "below median" group 1.5 with a difference of .5. The standard error of the difference between the two means was 2.498.

The "t" of 6.2 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" group and the "below median" group on the Reading Comprehension component was statistically significant.

Results on the General Achievement Test (Social Studies).-- The data on the Social Studies factor of the General Achievement Test as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" pupils of the seventh grade at the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 21 and 22 and Figure 11.

Above Median Group.-- The scores of the "above median" group ranged from a high of 84 to a low of 37, to show a mean score of 54.1, a median score of 48.25, with a standard devaition of 16.68, and a standard error

TABLE 21

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (SOCIAL STUDIES) AS OBTAINED BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

	Above Median		Below Median		Total	
Score	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
84-86	1	2.86			1	1.43
81-83	1	2.86			1	1.43
78-80	1	2.86			1	1.43
75-77	3	8.58			3.	4.29
72-74	1	2.86	2	5.72	3	4.29
69-71	3	8.58	1	2.86	4	5.72
66-68						
63-65	4	11.44			4	5.72
60-62						
57-59						
54-56	1	2.86			1	1.43
51-53						
48-50	2	5.72	2	5.72	4	5.72
45-47	2	5.72	3	8.58	5	7.15
42-44						
39-41	6	17.16	1	2.86	7	10.01
36-38	9	25.72	26	74.36	35	50.04
Total	35	100.00	35	100.00	70	100.00
Mean	54.1		41.5		47.8	
Median	48.25		37.5		38.5	
S.D.	16.68		9.972		12.81	
$S.E._m$	2.86		1.7		1.54	
G. P.	5.0		3.9			

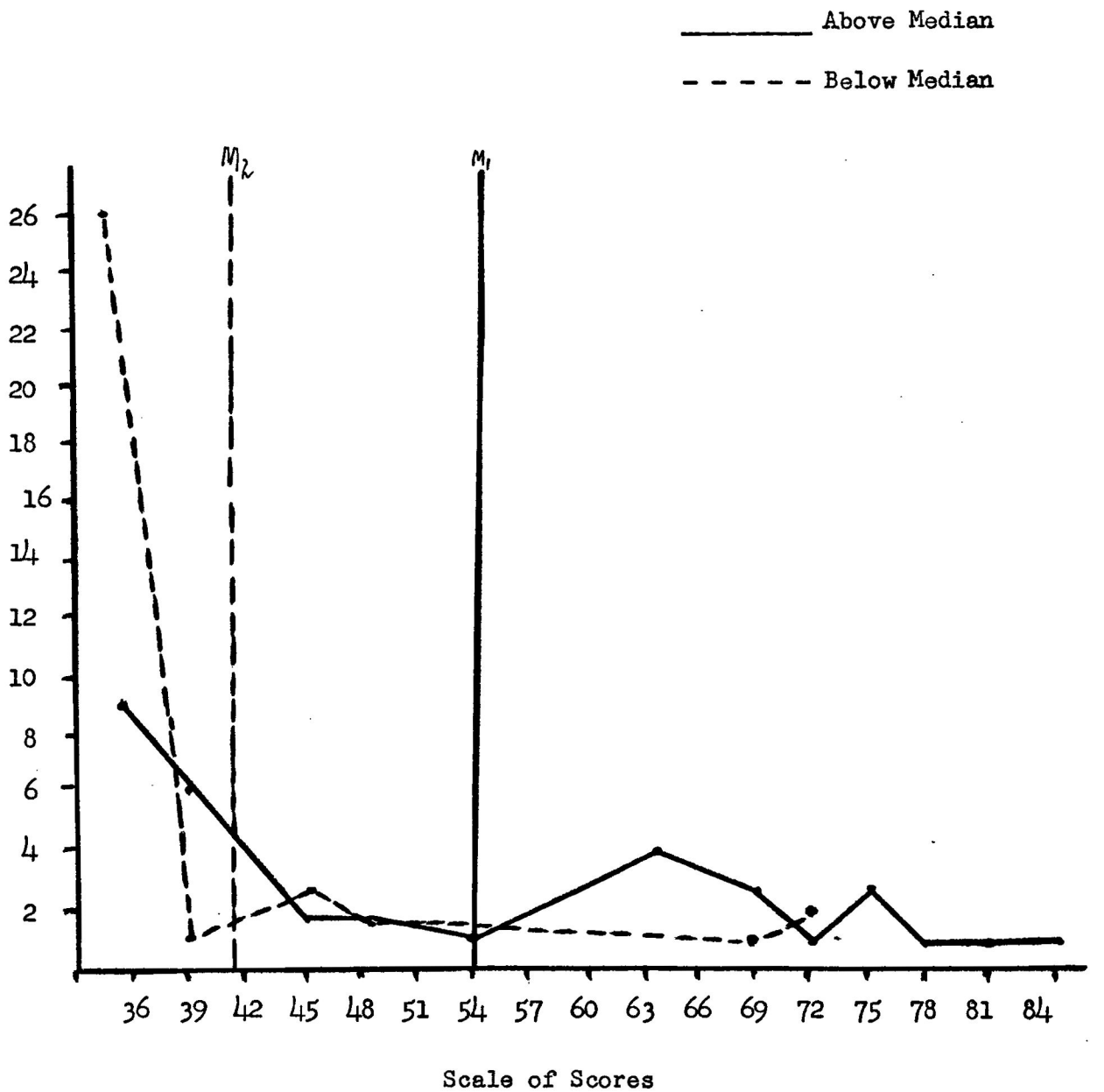

Fig. 11.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Social Studies) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 22

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (SOCIAL STUDIES) BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S.D.	$S.E._m$	$M_1 - M_2$	$S.E._{diff_m}$	"t"
"Above Median"	54.1	48.25	16.68	2.86	12.6	3.317	3.8
"Below Median"	41.5	37.5	9.972	1.7			

of the mean of 2.86.

Eighteen or 42.9 per cent of the pupils scored above the mean class interval, one or 2.86 per cent scored within the mean class interval, and 19 or 54.34 per cent of them scored below the mean class interval. The mean score of 54.1 was equivalent to a grade-placement of 5.0.

Below Median Group.-- The scores of the "below median" pupils ranged from a high of 73 to a low of 37, showing a mean score of 41.5, a median score of 37.5, with a standard deviation of 9.872, and a standard error of the mean of 1.7.

Eight or 22.88 per cent of the pupils scored above the mean class interval, none scored within the mean class interval, and 27 or 77.22 per cent of them scored below the mean class interval. The mean score of 41.5 was equivalent to a grade-placement of 3.9.

Comparative data and "t" Ratio.-- Table 22 shows that the mean score for the "above median" group was 54.1, for the "below median" group 37.5, with a difference of 13.6. The median for the "above median" group was 48.25, for the "below median" group 37.5, with a difference of 10.75. The standard deviation for the "above median" group was 16.68, for the "below

median" group 9.972, with a difference of 5.708. The standard error of the mean for the "above median" group was 2.86, for the "below median" group 1.7, with a difference of 1.16. The standard error of the difference between the two means was 3.317.

The "t" of 3.8 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference on the Social Studies component between the "above median" group and the "below median" group was statistically significant.

Results of the General Achievement Test (Health and Safety).-- The data on the Health and Safety factor of the General Achievement Test as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" seventh grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 23 and 24 and Figure 12.

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 79 to a low of 38, to show a mean score of 60.2, a median score of 59.54, with a standard deviation of 9.165, and a standard error of the mean of 1.57.

Fourteen or 40.04 per cent of the pupils scored above the mean class interval, four or 11.44 per cent of them scored within the mean class interval, and 17 or 48.62 per cent of them scored below the mean class interval. The mean score of 60.2 was equivalent to a grade-placement of 5.7.

Below Median Group.-- The scores of the "below median" pupils ranged from a high of 79 to a low of 38 to show a mean score of 49.9, a median score of 46.75, with a standard deviation of 7.221, and a standard error of the mean of 1.2.

Fifteen or 42.9 per cent of the pupils scored above the mean class interval, one or 2.86 per cent of them scored within the mean class interval,

TABLE 23

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (HEALTH AND SAFETY) AS OBTAINED BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Scores	Above Median		Below Median		Total	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
78-80			1	2.86	1	1.43
75-77	1	2.86			1	1.43
72-74	2	5.72			2	2.86
69-71	1	2.86			1	1.43
66-68	5	14.30	1	2.86	6	8.58
63-65	5	14.30	2	5.72	7	10.01
60-62	4	11.44	2	5.72	6	8.58
57-59	4	11.44	6	17.16	10	28.60
54-56	7	20.01	3	8.58	10	28.60
51-53						
48-50	2	5.72	1	2.86	3	8.58
45-47	1	2.86	6	17.16	7	10.01
42-44	1	2.86	5	14.30	6	8.58
39-41			1	2.86	1	1.43
36-38	2	5.72	7	20.01	9	15.73
Total	35	100.00	35	100.00	70	100.00
Mean	60.2		49.9		56.33	
Median	59.54		46.75		55.7	
S.D.	9.165		7.221		10.665	
$S.E._m$	1.57		1.2		1.27	
G. P.	5.7		4.6			

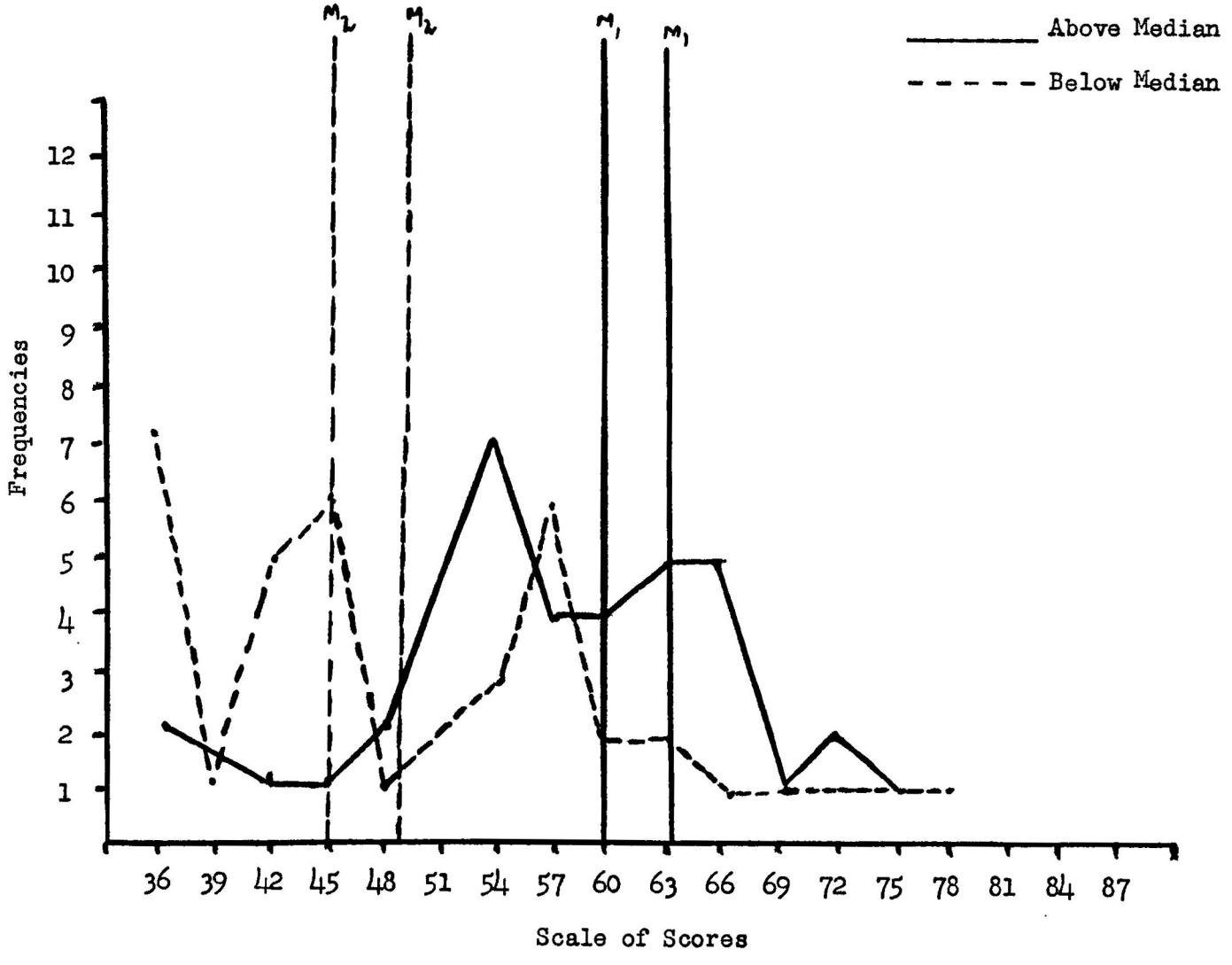

Fig. 12.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Health and Safety) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 24

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (HEALTH AND SAFETY) BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	S. $E._m$	$M_1 - M_2$	S.E.$diff_m$	"t"
"Above Median"	60.2	59.54	9.165	1.57	10.3	1.97	5.2
"Below Median"	49.9	46.75	7.221	1.2			

19 or 54.34 per cent of them scored below the mean class interval. The mean score of 49.9 was equivalent to a grade-placement of 4.6.

Comparative Data and "t" Ratio.-- Table 24 shows that the mean for the "above median" group was 60.2, for the "below median" group 49.9, with a difference of 10.3. The median score for the "above median" group was 59.54, for the "below median" group 46.75, with a difference of 12.79. The standard deviation for the "above median" group was 9.165, for the "below median" group 7.221, with a difference of 1.944. The standard error of the mean for the "above median" group was 1.57, for the "below median" group 1.2, with a difference of .37. The standard error of the difference between the two means was 1.97.

The "t" of 5.2 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference between the "above median" and the "below median" pupils on the Health and Safety component was statistically significant.

Results on The General Achievement Test (Arithmetic Reasoning).-- The data on the Arithmetic Reasoning factor of the General Achievement Test as obtained by the thirty-five "above median" and the thirty-five "below median" pupils of the Lemon Street School, 1956-1957, are presented in

Tables 25 and 26 and Figure 13.

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 74 to a low of 42 to show a mean score of 55.75, a median score of 55.71, with a standard deviation of 10.278, and a standard error of the mean of 1.76.

Sixteen or 45.76 per cent of the pupils scored above the mean class interval, five or 14.30 per cent of them scored within the mean class interval, and 14 or 40.04 per cent of them scored below the mean class interval. The mean score of 55.75 was equivalent to a grade-placement of 5.2.

Below Median Group.-- The scores of the thirty-five "below median" group ranged from a high of 56 to a low of 42, to show a mean score of 44.71, a median score of 43.75, with a standard deviation of 3.48, and a standard error of the mean of .6.

Five or 14.30 per cent of the pupils scored above the mean class interval, three or 8.58 per cent of them scored within the mean class interval, and 27 or 77.22 per cent of them scored below the mean class interval. The mean score of 44.41 was equivalent to a grade-placement of 4.2.

Comparative data and "t" Ratio.-- Table 26 shows that the mean for the "above median" group was 55.75, for the "below median" group 44.71, with a difference of 11.04. The median score for the "above median" group was 55.71, for the "below median" group 43.75, with a difference of 11.96. The standard deviation for the "above median" group was 10.278, for the "below median" group 3.48. With a difference of 6.798. The standard error of the mean for the "above median" group was 1.76, for the "below median" group .6, with a difference of 1.16. The standard error of the difference between the two means was 1.855.

The "t" of 5.9 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference

TABLE 25

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (ARITHMETIC REASONING) AS OBTAINED BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

	Above Median		Below Median		Total	
Scores	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
72-74	3	8.58			3	4.29
69-71	2	5.72			2	2.86
66-68	3	8.58			3	4.29
63-65	2	5.72			2	2.86
60-62	6	17.16			6	8.58
57-59						
54-56	5	14.30	1	2.86	6	8.58
51-53	2	5.72	4	11.44	6	8.58
48-50						
45-47	4	11.44	3	8.58	7	20.02
42-44	8	22.88	27	77.22	35	50.5
Total	35	100.00	35	100.00	70	100.00
Mean	55.75		44.71		47.4	
Median	55.71		43.75		44.5	
S.D.	10.278		3.48		9.765	
$S.E._m$	1.76		.6		1.2	
G. P.	5.2		4.2			

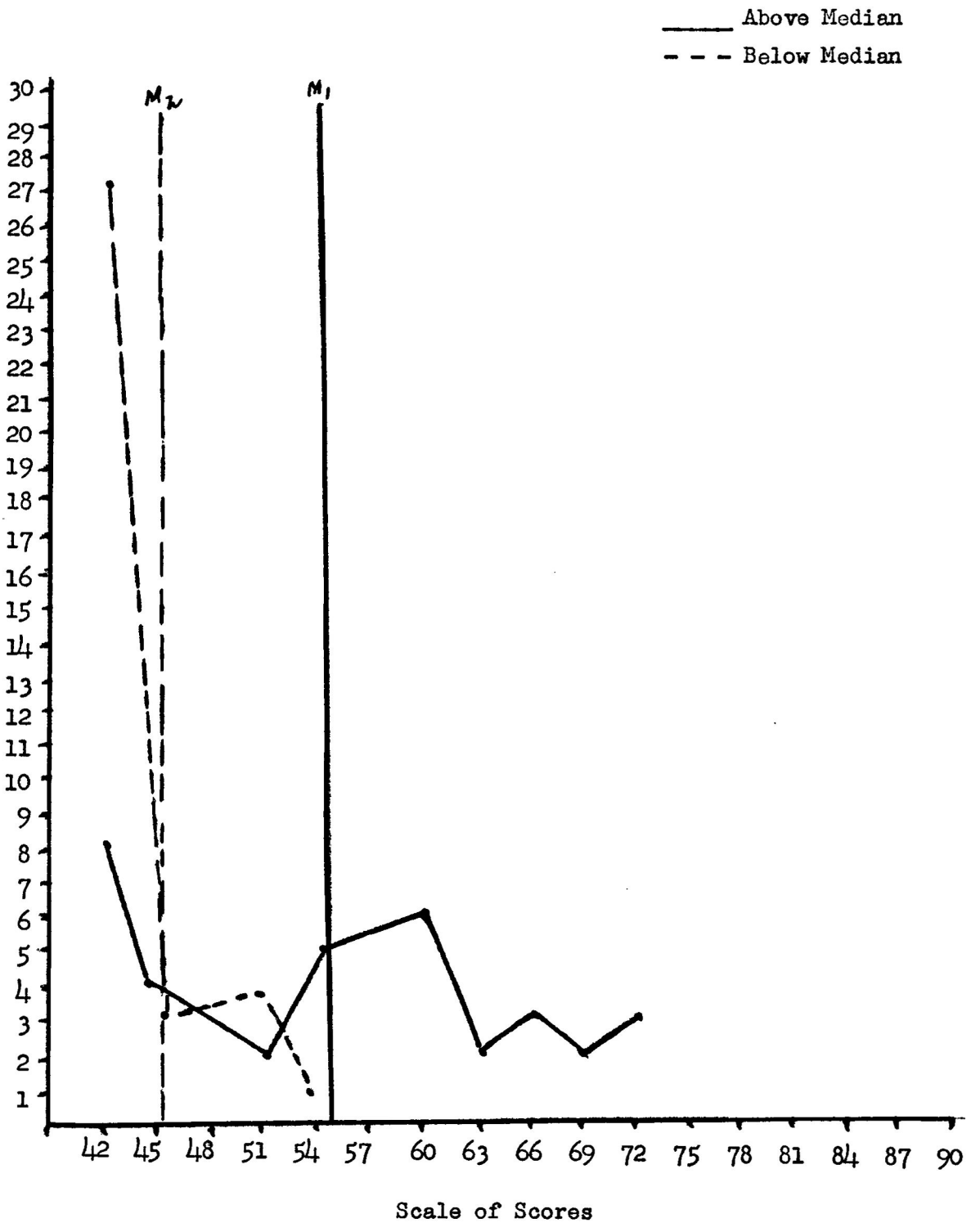

Fig. 13.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Arithmetic Reasoning) by the Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 26

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (ARITHMETIC REASONING) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	$S.E._m$	$M_1 - M_2$	$S.E.diff_m$	"t"
"Above Median"	55.75	55.71	10.278	1.76	11.04	1.855	5.9
"Below Median"	44.71	43.75	3.48	.6			

on the component of Arithmetic Reasoning between the "above median" group and the "below median" group of the Lemon Street School, Marietta, Georgia, was statistically significant.

Results on the General Achievement Test (Arithmetic Computation).-- The data on the Arithmetic Computation factor of the General Achievement Test as obtained by the scores of the thirty-five "above median" and the thirty-five "below median" seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957, are presented in Tables 27 and 28 and Figure 14.

Above Median Group.-- The scores of the thirty-five "above median" pupils ranged from a high of 87 to a low of 42, to show a mean score of 54.82, a median score of 50.2, with a standard deviation of 11.556, and a standard error of the mean of 1.98.

Eleven or 31.46 per cent of the pupils scored above the mean class interval, three or 8.58 per cent of them scored within the mean class interval, 21 or 60.6 per cent of the pupils scored below the mean class interval. The mean score of 54.82 was equivalent to a grade-placement of 5.1.

Below Median Group.-- The scores of the "below median" group ranged from a high of 56 to a low of 42, to show a mean score of 48.6, a median

TABLE 27

DISTRIBUTION OF THE RAW SCORES ON THE GENERAL ACHIEVEMENT TEST (ARITHMETIC COMPUTATION) AS OBTAINED BY THE THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

	Above Median		Below Median		Total	
Scores	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
87-89	1	2.86			1	1.43
84-86						
81-83						
78-80						
75-77	2	5.72			2	2.86
72-74	2	5.72			2	2.86
69-71						
66-68	1	2.86			1	1.43
63-65	4	11.44			4	5.72
60-62						
57-59	1	2.86			1	1.43
54-56	3	8.58	1	2.86	4	5.72
51-53	3	8.58	3	8.58	6	8.58
48-50	9	25.74	7	20.02	16	22.88
45-46	1	2.86	3	8.58	4	5.72
42-44	8	22.88	21	60.06	28	40.04
Total	35	100.00	35	100.00	70	100.00
Mean	54.82		48.6		50.1	
Median	50.2		44		47.875	
S.D.	11.556		3.009		9.765	
$S.E._m$	1.98		.5		1.2	
G. P.	5.1		4.7			

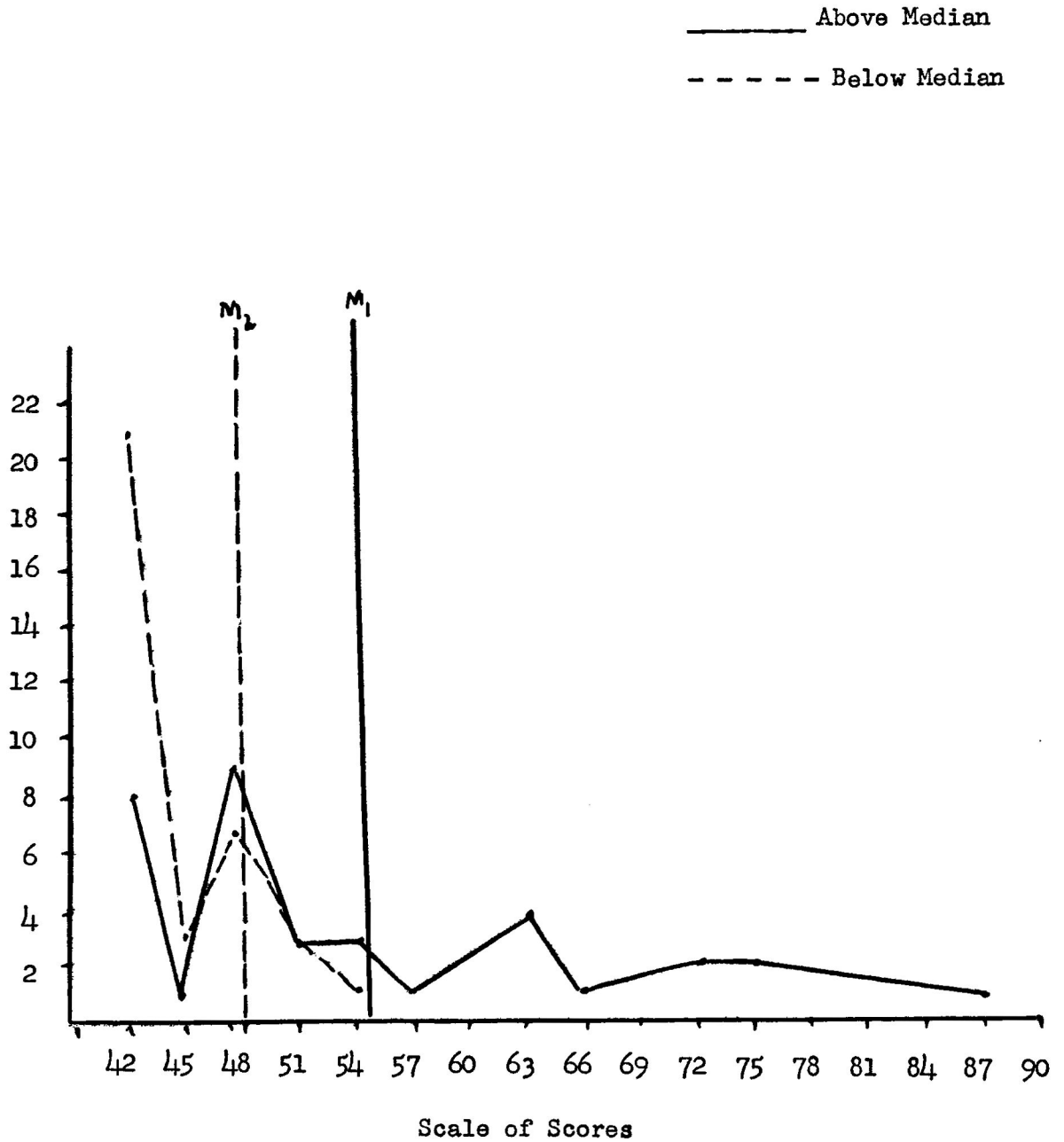

Fig. 14.— Frequency Polygon of Raw Scores Made on the General Achievement Test (Arithmetic Computation) by Thirty-five "Above Median" and Thirty-five "Below Median" Pupils of the Lemon Street School, 1956-57.

TABLE 28

COMPARATIVE DATA FOR SCORES OBTAINED ON THE GENERAL ACHIEVEMENT TEST (ARITHMETIC COMPUTATION) BY THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Group	Means	Median	S. D.	S. $E._m$	$M_1 - M_2$	S.E.$diff_m$	"t"
"Above Median"	54.82	50.2	11.556	1.98	16.22	2.04	3.
"Below Median"	48.6	44	3.009	.5			

score of 44, with a standard deviation of 3.009, and a standard error of the mean of .5.

Four or 11.44 per cent of the pupils scored above the mean class interval, seven or 20.02 per cent of them scored within the mean class interval, 24 or 68.64 per cent of them scored below the mean class interval. The mean score of 48.6 was equivalent to a grade-placement of 4.7.

Comparative Data and "t" Ratio.-- Table 28 shows that the mean for the "above median" group was 54.82, for the "below median" group 48.6 with a difference of 6.22. The median for the "above median" group was 50.2, for the "below median" group 44, with a difference of 6.2. The standard deviation for the "above median" group was 11.556, for the "below median" group 3.009, with a difference of 8.547. The standard error of the mean for the "above median" group was 1.98, for the "below median" group .5, with a difference of 1.48. The standard error of the difference between the two means was 2.04.

The "t" of 3 was significant in that it was larger than the "t" of 2.58 at the one per cent level of confidence. Therefore, the difference on the component on Arithmetic Computation between the "above median" and the "below median" groups was statistically significant.

SUMMATIONS

Introduction.-- The final section of this research report is presented under two major categories, to wit: (a) the resume of the quantitative data statistics, and (b) a series of interpretative summaries on the respective test results.

Resume of Findings.-- All the quantitative measures necessary for analyzing and interpreting the data presented in this chapter are summarized in Table 29, page 67. The specific content of each table is indicated below.

The "above median" group and the "below median" group were paired for data on:

1. The differences in the chronological ages of the two groups, Tables 1 and 2, and Figure 1.
2. The differences on the Otis Quick-Scoring Mental Ability Test in Tables 3 through 6, and Figures 2 and 3.
3. The differences on the General Achievement Test in Tables 7 through 28, and Figures 4 through 14.

Interpretative summaries of the quantitative data in the consolidated Table 29, which, in turn, was derived from the analytical comparison of the basic data as presented in the 28 original tables of this chapter will be presented in the next section.

Interpretative Summaries.-- The interpretative summaries of the findings of this study are reported under three headings:

(a) Data on the chronological ages of the two groups of pupils

(b) Data on the Otis Quick-Scoring Mental Ability Test

(c) Data on the General Achievement Test.

TABLE 29

SUMMARY OF DATA FROM THE RESULTS ON THE CHRONOLOGICAL AGES, THE OTIS QUICK-SCORING MENTAL ABILITY TEST, AND THE GRAY-VOTAW-ROGERS GENERAL ACHIEVEMENT TEST ADMINISTERED TO THIRTY-FIVE "ABOVE MEDIAN" AND THIRTY-FIVE "BELOW MEDIAN" PUPILS IN THE SEVENTH GRADE OF THE LEMON STREET SCHOOL, MARIETTA, GEORGIA, 1956-57

Area	Above Median Group					Below Median Group						
	Mean	Median	S. D.	$S. E._m$	G. P.	Mean	Median	S. D.	$S. E._m$	G. P.	$S.E.diff_m$	"t"
Chronological Ages	153.9	150.37	9.27	1.6		166	163	15.56	2.7		2.07	5.8
Otis Quick-Scoring Mental Ability Test												
Total Mental Factors	29.2	28.15	5.61	9.62		14.2	12.44	4.452	.783		1.25	10.2
Beta I.Q.s	91.7	90.25	6.624	1.18		68.97	69.57	6.318	1.08		1.592	13.9
General Achievement Test												
Total Achievement	58.78	56	9.384	1.6		48.22	47.05	5.116	.88		1.84	6
Elementary Schience	48.4	43.75	15.74	2.6	4.7	42.49	40	6.8	1.1	3.9	2.82	3.16
Language	62.2	65	13.02	2.23	5.9	52.69	43	14.65	2.5	4.9	3.35	2.83
Literature	61	58.35	18	3.09	5.4	52.18	47.27	13.29	2.3	4.8	3.852	2.3
Spelling	68.2	67.1	11.556	1.98	6.8	55.3	52.5	11.43	1.97	5.1	2.792	4.6
Reading Vocabulary	59.2	59.88	10.83	1.9	5.6	46.6	44.71	7.62	1.3	4.4	2.99	5.05
Reading Comprehension	63.79	62.68	11.7	2	6.2	48.4	44.53	8.826	1.5	4.5	2.498	6.2
Social Studies	54.1	48.25	16.68	2.86	5.0	41.5	37.5	9.972	1.7	3.9	3.317	3.8
Health and Safety	60.2	59.54	9.165	1.57	5.7	49.9	46.75	7.221	1.2	4.6	1.97	5.2
Arithmetic Reasoning	55.75	55.71	10.278	1.76	5.2	44.71	43.75	3.48	.6	4.2	1.855	5.9
Arithmetic Computation	54.82	50.3	11.556	1.98	5.1	48.6	44	3.009	.5	4.7	2.04	3

Interpretative Summary of the Chronological Ages.-- The data on the chronological ages of the thirty-five "above median" and the thirty-five "below median" pupils as presented in Table 29 may be summarized as follows:

1. The data on the chronological ages of the groups involved in the study showed that there was a significant difference between them in this respect.
2. There was a difference of 12.1 in the mean raw scores of the two groups of pupils.
3. The computed "t", 5.8 with 70 degrees of freedom justified the significance of the obtained difference at the one per cent level of confidence.

Interpretative Summary on the Otis Quick-Scoring Mental Ability Test.-- The data on the Otis Quick-Scoring Mental Ability Test for the thirty-five "above median" and the thirty-five "below median" pupils as presented in Table 29 may be summarized as follows:

1. For the total score index of the eighty separate factors which comprise the Otis Quick-Scoring Mental Ability Test a significant difference was found between the "above median" group and the "below median" group in favor of the "above median" group.
2. There was a difference of 15 in the mean raw scores obtained by the thirty-five "above median" and the thirty-five "below median" pupils.
3. The computed "t", 10.2, with 70 degrees of freedom, justified the obtained significance at the one per cent level of confidence.

4. The data on the computed Beta I. Q.'s of the groups involved in this study, also, indicated a significant difference in favor of the "above median group.

5. There was a difference of 22.2 in the mean raw scores of the two groups of pupils.

6. The computed "t" of 13.9, with 70 degrees of freedom justified the significance of the obtained difference at the one per cent level of confidence.

Interpretative Summary on the General Achievement Test.-- The data on the General Achievement Test for the thirty-five "above median" and the thirty-five "below median" pupils as presented in Table 29 may be summarized as follows:

1. There was a significant difference on all of the total scores on all of the factors on the General Achievement Test in favor of the "above median" group except on the Literature Test.

2. The grade-placement for the "above median" group was 5.6, for the "below median" group it was 4.5.

3. The computed "t" of 6 with 70 degrees of freedom justified the significance of the obtained difference at the one per cent level of confidence.

4. The data indicated that the "above median" group achieved a higher level of school achievement in terms of grade-placement than did the "below median" group.

CHAPTER III

SUMMARY AND CONCLUSIONS

Introductory Statement.-- Any educational provision for the child must be subject to continuous appraisal in light of the best educational practice. It will modify its program and method of instruction to fit the social demands and needs of the child. In order to do this, modern educational methods require that educators evaluate the work that pupils do so that the program goals of the school may be properly set. Evaluation is regarded as part of instruction and as continuous.

Not only have measuring experts said that tests should measure the objectives of a class or school level, but the program of evaluation should involve evidence as to the extent to which pupils are showing development in the attainment of these goals.

The school should deal not only with the achievement of children in such basic skills as reading, spelling, social studies, arithmetic, character, science, social competence, and the like, but it should, also, measure the mental ability of children so that it can determine whether or not its pupils have the ability to pursue such a curriculum. Discrepancies between the levels of achievement and social development on the one hand, and the level of intelligence on the other hand, may indicate that the use of new materials and teaching methods may be needed, or that the entire program may need revamping.

To advance a child grade by grade merely because he ages year by year may be well enough for many individuals, but it seriously handicaps the boy or girl distinctly brighter than others of the same age, and overstrains

the one who is duller. To be held back and assigned tasks too easily executed breeds laziness and not infrequently is found to be the root of misconduct in the classroom. On the other hand, it is uneconomical of effort and ability to promote those less educable than others of the same age. If slow pupils are forced to attempt to keep abreast of pupils who learn more rapidly, they may take refuge in a defeatist attitude -- a condition of lowered morale -- so reducing efficiency that it should be avoided at all costs.[1]

Most children in the past have been denied adequate education and some are being poorly trained now because of the lack of being exposed to adequate programs of evaluation. It is interesting to note that our most progressive schools are those which are employing every possible means to develop better evaluation programs. Improvements are being made on old instruments and new ones are being developed, but their best contribution to any school situation depends upon their improved utilization in motivating a more efficient teaching-learning situation.

Statement of the Problem.-- The problem involved in this study was to determine the tested differences in the intelligence and achievement levels of the "above median" and the "below median" groups of seventh-grade pupils of the Lemon Street School, Marietta, Georgia, 1956-1957.

Purpose of the Study.-- The aim of this study was to ascertain the significant differences in the overall intelligence and achievement of pupils scoring above the median and those scoring below the median of the total distribution of seventh-grade pupils in the Lemon Street School, Marietta, Georgia, 1956-1957.

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[1]John F. Dashiel, Fundamentals of General Psychology (Atlanta, Ga., 1937), pp. 355-6.

More specifically, the ultimate objective of this research was to determine:

1. The measures of central tendency and variability in the chronological ages of the pupils who scored above the median and those who scored below the median, respectively.
2. The significant difference, if any, in the chronological ages of the "above median" and the "below median" groups.
3. The measures of central tendency and variability in the intelligence of the pupils who scored above the median and those who scored below the median, respectively.
4. The significant difference, if any, in the intelligence of the "above median" and the "below median" groups.
5. The measures of central tendency and variability in the achievement of the pupils who scored above the median and those who scored below the median, respectively.
6. The significant difference, if any, in the achievement of the "above median" and the "below median" groups.
7. Any findings or interpretations which give promise of improved school policies, procedures, and techniques.

Definition of Terms.-- The important terms used in this study are defined in the following statements:

1. The term, "intelligence", as used in this study refers to the traits of mental development as measured by the Otis Quick-Scoring Mental Ability Test.
2. The term, "achievement", as used in this study refers to academic performance as measured by the Gray-Votaw-Rogers General Achievement Test.
3. The term, "above median", group as used in this study refers to those pupils whose scores fell above the median of the total distribution of scores on the Otis Quick-Scoring Mental Ability Test.

4. The term, "below median", group as used in this study refers to those pupils whose scores fel below the median of the total distribution of scores on the Otis Quick-Scoring Mental Ability Test.

Locale and Research Design of Study.-- The significant aspects of the locale and research-design of this study are indicated below.

1. Locale and Period: This study was conducted during the second semester of the 1956-57 school year at the Lemon Street School, Marietta, Georgia.

2. Research Method: The Descriptive-Survey Method of research employing the techniques of testing and statistical treatment was used to collect the data.

3. Subjects: The subjects used in this study were seventy boys and girls enrolled in the seventh-grade of the Lemon Street School, Marietta, Georgia, during the second semester of the 1956-57 term.

4. Instruments: The instruments used in this research were: (a) Otis Quick-Scoring Mental Ability Test, (b) Gray-Votaw-Rogers General Achievement Test.

5. Criterion of Reliability: The "criterion of reliability" used to test the significant differences of the data between the two groups: "above median" and "below median" was Fisher's "t" of 2.58 at the one per cent level of confidence for 70 degrees of freedom.

The remaining sections of this chapter will be in this order: Summary of Related Literature, Basic Findings, Conclusions, Implications, and Recommendations.

Summary of Related Literature.-- The literature that was reviewed in this study was concerned primarily with the difference between groups on tests of intelligence and achievement.

The most significant point that the writer gathered from the literature is that intelligence and achievement are very closely related, and that the achievement depends upon the degree of intelligence.

Subsidiary points disclosed in the review of the literature are as follows:

1. The range of I. Q.'s varies greatly, but according to national norms set up by the achievement of pupils all over the country the majority seem to cluster about the mean or average score of 100.
2. When a person or a group of persons' intelligence is evaluated they must be compared with the population of which they are members.
3. The literature points out that people tend more often to be above average or below average in their achievements rather than good in some and bad in others.
4. The correlations between intelligence test scores and school performance are high but by no means perfect because other factors have to do with achievement, for example, health, personality traits, and work habits. However, the score that he makes upon a good intelligence test is the best indicator of probable school achievement.

Summary of Basic Findings.-- The summation of the findings of this study was organized under three captions: (1) The difference between the two groups in chronological ages; (2) The difference between the two groups in intelligence, and (3) The difference between the two groups in achievement. This summation is presented in the sections to follow.

Age Levels of the Thirty-Five "Above Median" and the Thirty-five "Below Median" Pupils of the Lemon Street School, Marietta, Georgia, 1956-1957

Chronological Ages
(Tables 1 and 2, and Figure 1)

General Summary.-- The basic statistics on the Chronological Ages of the two groups were as follows: The means were 152.9 and 166 for the

"above median" and the "below median" groups, respectively; the median scores were 150.35 and 163 for the "above median" and the "below median" groups, respectively; the standard deviations were 9.27 and 15.56 for the "above median" and the "below median" groups, respectively; the standard error of the means were 1.6 and 2.7 for the "above median" and the "below median" groups, respectively. The two groups showed a difference in the mean score of 12.1, with a standard error of the difference between the two means of 2.07, with a resultant "t" of 5.8 which was significant.

The "below median" group was older than the "above median" group.

Above Median Group

The statistical measures on the chronological ages were: a range of 42 months, with a mean score of 153.9, a median score of 150.35, the standard deviation was 9.27, and the standard error of the mean was 1.6.

Below Median Group

The statistical measures on the chronological ages were: a range of 64, a mean score of 166, a median score of 163, the standard deviation was 15.56, and the standard error of the mean was 2.7.

Significant Difference

The data on the chronological ages for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 2.07, and a "t" of 5.8 which was more than 2.58 at the one per cent level of confidence.

Intelligence Levels of Thirty-five "Above Median" and the Thirty-five "Below Median" Pupils of the Lemon Street School, Marietta, Georgia, 1956-57

Otis Quick-Scoring Mental Ability Test
(Total Mental Factors)
(Tables 3 and 4 and Figure 2)

General Summary.-- The basic statistics on the Otis Quick-Scoring Mental Ability Test for the two groups were as follows: The means were 29 and 14.2 for the "above median" and the "below median" groups, respectively; the median scores were 28.15 and 12.44 for the "above median" and the

"below median" groups, respectively; the standard deviations were 5.61 and 4.452 for the "above median" and the "below median" groups, respectively; the standard error of the means were .962 and .783 for the "above median" and the "below median" groups, respectively. The two groups showed a difference in the mean score of 15, with a standard error of the difference between the two means of 1.25 with a "t" of 10.2.

The "above median" group was superior to the "below median" group in their mental development.

Above Median Group

The statistical measures of the Total Test were: a range of 24, with a mean score of 29, a median score of 28.15, the standard deviation was 5.61, and the standard error of the mean was .962.

Below Median Group

The statistical measures of the Total Test were: a range of 16, with a mean score of 14.2, a median score of 12.44, the standard deviation was 4.452, and the standard error of the mean was .783.

Significant Differences

The Total Test for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 1.25, and a "t" of 10.2, which was more than 2.58 at the one per cent level of confidence.

Otis Quick-Scoring Mental Ability Test
(Computed Beta I.Q.'s)
(Tables 5 and 6 and Figure 3)

General Summary.-- The range of scores for the two groups on computed Beta I. Q.'s were as follows: The means were 91.17 and 68.97 for the "above median" and the "below median" groups, respectively; the median scores were 90.25 and 69.571 for the "above median" and the "below median" groups, respectively; the standard deviations were 6.624 and 6.318 for the "above median" and the "below median" groups, respectively; the standard error of the means were 1.18 and 1.08 for the "above median" and the "below median" groups, respectively. The two groups showed a difference in the mean score

of 22.2, with a standard error of the difference of the two means of 1.592 with a "t" of 13.9.

The "above median" group was superior to the "below median" group in Beta I.Q.'s.

Above Median Group

The statistical measures of the computed Beta I. Q.'s were: a range of 28, with a mean score of 91.17, a median score of 90.26, with a standard deviation of 6.62, and the standard error of the mean was 1.18.

Below Median Group

The statistical measures of the computed Beta I. Q.'s were: a range of 25, with a mean score of 68.97, a median score of 69.57, with a standard devation of 6.318, and the standard error of the mean was 1.08.

Significant Differences

The computed Beta I. Q.'s for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 1.592, and a "t" of 13.9 which was larger than 2.58 at the one per cent level of confidence.

Achievement Levels of the Thirty-five "Above Median" and the Thirty-five "Below Median" Pupils of the Lemon Street School, Marietta, Georgia, 1956-1957

General Achievement Test
(Total Averages)
(Tables 7 and 8 and Figure 4)

General Summary.-- On the General Achievement Test (Total Averages) the range of scores for the two groups were as follows: The ranges were 33 and 19 for the "above median" and the "below median" groups, respectively; the means were 58.78 and 48.22 for the "above median" and the "below median" groups, respectively; the standard deviations were 9.384 and 5.116 for the "above median" and the "below median" groups, respectively; the standard error of the means were 1.6 and .88 for the "above median" and the "below

median" groups, respectively; the standard error of the difference between the two means was 1.814, with a "t" of 6.

The "above median" group was superior to the "below median" group in their school achievement.

Above Median Group

The statistical measures of the General Achievement Test (Total Averages) were: a range of 33, with a mean score of 58.78, a median score of 56, a standard deviation of 9.384, and the standard error of the mean was 1.6.

Below Median Group

The statistical measures of the General Achievement Test (Total Averages) were: a range of 19, with a mean score of 48.22, a median score of 47.05, a standard deviation of 5.116, and the standard error of the mean was .88.

Significant Differences

The General Achievement Test (Total Averages) for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 1.814, and a "t" of 6, which was more than 2.58 at the one per cent level of confidence.

General Achievement Test
(Science)
(Tables 9 and 10 and Figure 5)

Above Median Group

The statistical measures of the Elementary Science Test were: a range of 50, with a mean of 48.4, and a median score of 43.75, the standard deviation was 15.74, and the standard error of the mean was 2.37.

Below Median Group

The statistical measures of the Elementary Science Test were: a range of 26, with a mean of 42.41, a median score of 40, the standard deviation was 6.8, and the standard error of the mean was 2.6.

Significant Differences

The Elementary Science factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 2.82, and a "t" of 3.16, which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Language)
(Tables 11 and 12 and Figure 6)

Above Median Group

The statistical measures of the Language factor were: a range of 52, with a mean of 62.2, a median score of 65, the standard deviation was 13.03, and the standard error of the mean was 2.23.

Below Median Group

The statistical measures of the Language factor were: a range of 52, with a mean of 52.69, a median score of 43, the standard deviation was 14.65, and the standard error of the mean was 2.5.

Significant Differences

The Language factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 3.35, and a "t" of 2.83, which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Literature)
(Tables 13 and 14 and Figure 7)

Above Median Group

The statistical measures of the Literature factor were: a range of 46, with a mean score of 66.1, and a median score of 58.85, the standard deviation was 18, and the standard error of the mean was 3.09.

Below Median Group

The statistical measures of the Literature factor were: a range of 40, with a mean score of 52.18, and a median score of 47.27, the standard deviation was 13.29, and the standard error of the mean was 2.3.

Significant Differences

The Literature factor for the "above median" and the "below median" group showed a standard error of the difference between the two means of 3.852, and a "t" of 2.3, which was smaller than 2.58 at the one per cent level of confidence.

General Achievement Test
(Spelling)
(Tables 15 and 16 and Figure 8)

Above Median Group

The statistical measures of the Spelling factor were: a range of 45, with a mean score of 68.2, and a median score of 67.1, the standard deviation was 11.56, and the standard error of the mean was 1.98.

Below Median Group

The statistical measures of the Spelling factor were: a range of 41, with a mean score of 55.3, and a median score of 52.5, the standard deviation was 11.43 and the standard error of the mean was 3.47.

Significant Differences

The Spelling factor of the "above median" and the "below median" groups showed a standard error of the difference between the two means of 2.792, and a "t" of 4.6 which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Reading Vocabulary)
(Tables 17 and 18 and Figure 9)

Above Median Group

The statistical measures of the Reading Vocabulary were: a range of 34, with a mean of 59.2, and a median score of 59.88, the standard deviation was 10.83, and the standard error of the mean was 1.9.

Below Median Group

The statistical measures of the Reading Vocabulary were: a range of 22, with a mean score of 46.6, and a median score of 44.11, the standard deviation was 7.62, and the standard error of the mean was 1.3.

Significant Differences

The Reading Vocabulary factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 2.99, and a "t" of 5.05 which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Reading Comprehension)
(Tables 19 and 20 and Figure 10)

Above Median Group

The statistical measures of the Reading Comprehension factor were: a range of 45, with a mean score of 63.79, and a median score of 62.68, the standard deviation was 11.7, and the standard error of the mean was 2.

Below Median Group

The statistical measures of the Reading Comprehension factor were: a range of 15, with a mean score of 48.4, a median score of 44.53, the standard deviation was 8.826, and the standard error of the mean was 1.5.

Significant Differences

The Reading Comprehension factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 2.498, and a "t" of 6.2 which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Social Studies)
(Tables 21 and 22 and Figure 11)

Above Median Group

The statistical measures of the Social Studies factor were: a range of 47, with a mean score of 54.1, and a median score of 48.25, the standard deviation was 16.68, and the standard error of the mean was 1.7.

Below Median Group

The statistical measures of the Social Studies Factor were: a range of 36, a mean score of 41.5, and a median score of 37.5, the standard deviation was 9.972 and the standard error of the mean was 1.7.

Significant Differences

The Social Studies factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 3.317, and a "t" of 3.8 which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Health and Safety)
(Tables 23 and 24 and Figure 12)

Above Median Group

The statistical measures of the Health and Safety factor were: a range of 41, with a mean score of 60.2, and a median score of 59.54, the standard deviation was 7.221, and the standard error of the mean was 1.57.

Below Median Group

The statistical measures of the Health and Safety factor were: a range of 41, with a mean score of 49.9, and a median score of 46.75, the standard deviation was 7.221, and the standard error of the mean was 1.2.

Significant Differences

The Health and Safety factor for the "above median" and the "below median" pupils showed a standard error of the difference between the two means of 1.97, and a "t" of 5.2 which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Arithmetic Reasoning)
(Tables 25 and 26 and Figure 13)

Above Median Group

The statistical measures of the Arithmetic Reasoning factor were: a range of 32, a mean score of 55.25, and a median score of 55.71; the standard deviation was 10.278, and the standard error of the mean was 1.76.

Below Median Group

The statistical measures of the Arithmetic Reasoning factor were: a range of 14, with a mean score of 44.71, and a median score of 43.75, the standard deviation was 3.48, and the standard error of the mean was .6.

Significant Differences

The Arithmetic Reasoning factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 1.855, and a "t" of 5.9, which was larger than 2.58 at the one per cent level of confidence.

General Achievement Test
(Arithmetic Computation)
(Tables 27 and 28 and Figure 14)

Above Median Group

The statistical measures of the Arithmetic Computation factor were: a range of 45, with a mean score of 54.82, and a median score of 50.2; the standard deviation was 11.556, and the standard error of the mean was 1.98.

Below Median Group

The statistical measures of the Arithmetic Computation factor were: a range of 14, with a mean score of 48.6, and a median score of 44; the standard deviation was 3.009, and the standard error of the mean was .5.

Significant Differences

The Arithmetic Computation factor for the "above median" and the "below median" groups showed a standard error of the difference between the two means of 2.04, and a "t" of 3 which was larger than 2.58 at the one per cent level of confidence.

Conclusions.-- The analysis and interpretation of the findings of this study appears to warrant the following conclusions:

1. The data seemed to warrant the conclusion that the "above median" group and the "below median" group of these seventy seventh-grade pupils were not drawn from the same population of intelligence for significant differences for Fisher's "t" were found in the total mental factors and the computed Beta I. Q.'s.

2. The data seemed to warrant the conclusion that the "above median" group and the "below median" group of these seventy seventh-grade pupils were not drawn from the same population of school achievement for Fisher's "t" was found significant throughout the range of components except the Literature component.

3. The data seemed to warrant the conclusion that the achieved norms of both groups were lower than the norms indicated on the standardized tests used.

Implications.-- The implications for education theory and practice that grew out of this study are stated below:

1. From the data it appears that there is a need for improved educational diagnosis at the Lemon Street School through which points and/or areas of strengths and weaknesses in

the teaching-learning situation may be properly identified.

2. From the data it seemed highly probable that these groups reflected the established fact that there is an appreciable association between intelligence and achievement.

Recommendations.-- The findings of this research appear to justify these recommendations:

1. That the Lemon Street School consider the redirection and re-emphasizing of its instructional procedure so as to determine to what extent the shortcomings revealed in these tests were the results of intelligence or the educational process.
2. That the Lemon Street School set up a testing program and employ it in classifying pupils so that the needs of pupils may be met more adequately, and that discipline problems arising from pupils failing to achieve on the class or group level may be minimized.
3. That further consideration should be given to the location and use of information in all grade levels so that deficiencies evidenced by the upper grade levels may be reduced.
4. That information from test results and teacher observation should form the basis for inservice study of the various content areas, and ways of remedial methods used toward alleviating the deficiencies.

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APPENDIX

Otis Quick-Scoring Mental Ability Tests: New Edition

BETA TEST: FORM FM

BETA
FM

by Arthur S. Otis

Do not open this booklet, or turn it over, until you are told to do so.
Fill these blanks, giving your name, age, birthday, etc. Write plainly.

Name..... Grade..... Boy..... Girl.....
First name Initial Last name

Date of birth..... How old are you now?.....
Month Day Year

Date.....19.....School..... City and state.....

Read these directions. Do what they tell you to do.

This is a test to see how well you can think. It contains questions of different kinds. Under each question there are four or five possible answers. You are to read each question and decide which of the answers below it is the right answer. Do not spend too much time on any one question. Here are three sample questions.

Sample a: Which one of the five things below is soft?

(1) **glass** (2) **stone** (3) **cotton** (4) **iron** (5) **ice**

The right answer, of course, is *cotton*. The word *cotton* is No. 3. Now look at the "Answer Spaces for Samples" at the right. In the five spaces after the Sample "a," a heavy mark has been made, filling the space under the 3. This is the way to answer the questions.

Try the next sample question yourself. Do not write the answer; just put a heavy mark in the space under the number corresponding to the right answer.

ANSWER SPACES FOR SAMPLES

	1	2	3	4	5
a	⋮	⋮	▮	⋮	⋮
	6	7	8	9	10
b	⋮	⋮	⋮	⋮	⋮
	11	12	13	14	15
c	⋮	⋮	⋮	⋮	⋮

Sample b: A robin is a kind of —

(6) **plant** (7) **bird** (8) **worm** (9) **fish** (10) **flower**

The answer is *bird*, which is answer 7; so you should answer Sample "b" by putting a heavy mark in the space under the 7. Try the Sample "c."

Sample c: Which one of the five numbers below is larger than 55?

(11) **53** (12) **48** (13) **29** (14) **57** (15) **16**

The correct answer for Sample "c" is 57, which is No. 14; so you would answer Sample "c" by making a heavy black mark that fills the space under the number 14. Do this now.

Read each question carefully and decide which one of the answers is best. Notice what number your choice is. Then, on the answer sheet, make a heavy black mark in the space under that number. In marking your answers, always be sure that the question number on the answer sheet is the same as the question number in the test booklet. Erase completely any answer you wish to change, and be careful not to make stray marks of any kind on your answer sheet or on your test booklet. When you finish a page, go on to the next page. If you finish the entire test before the time is up, go back and check your answers. Work as rapidly and as accurately as you can.

The test contains 80 questions. You are not supposed to be able to answer all of them, but do the best you can. You will be allowed half an hour after the examiner tells you to start. Try to get as many questions right as possible. Be careful not to go so fast that you make mistakes. Do not spend too much time on any one question. No questions about the test will be answered by the examiner after the test begins. Lay your pencil down.

Do not turn this booklet until you are told to begin.

Published by World Book Company, Yonkers-on-Hudson, New York, and Chicago, Illinois

PRINTED IN U.S.A. BETA: FM-5

ANSWER SHEET

OTIS QUICK-SCORING—NEW EDITION: BETA FM

IQ_____

SCORE_____

AGE_____ Years _____ Months

Page 3

1	1	2	3	4	5
2	6	7	8	9	10
3	11	12	13	14	15
4	16	17	18	19	20
5	21	22	23	24	
6	26	27	28	29	30
7	31	32	33	34	35
8	36	37	38	39	
9	41	42	43	44	45
10	46	47	48	49	50
11	51	52	53	54	55
12	56	57	58	59	60
13	61	62	63	64	65
14	66	67	68	69	70
15	71	72	73	74	75
16	76	77	78	79	
17	81	82	83	84	85
18	86	87	88	89	90
19	91	92	93	94	95
20	1	2	3	4	5
21	6	7	8	9	10
22	11	12	13	14	15
23	16	17	18	19	20
24	21	22	23	24	25

Page 4

25	26	27	28	29	30
26	31	32	33	34	35
27	36	37	38	39	40
28	41	42	43	44	45
29	46	47	48	49	50
30	51	52	53	54	
31	56	57	58	59	60
32	61	62	63	64	65
33	66	67	68	69	
34	71	72	73	74	75
35	76	77	78	79	80
36	81	82	83	84	85
37	1	2	3	4	5
38	6	7	8	9	10
39	11	12	13	14	15
40	16	17	18	19	
41	21	22	23	24	25
42	26	27	28	29	30
43	31	32	33	34	35
44	36	37	38	39	40

Page 5

45	41	42	43	44	45
46	46	47	48	49	
47	51	52	53	54	55
48	56	57	58	59	
49	61	62	63	64	65
50	66	67	68	69	
51	71	72	73	74	75
52	1	2	3	4	5
53	6	7	8	9	10
54	11	12	13	14	15
55	16	17	18	19	20
56	21	22	23	24	25
57	26	27	28	29	30
58	31	32	33	34	35
59	36	37	38	39	
60	41	42	43	44	45
61	46	47	48	49	50
62	51	52	53	54	
63	56	57	58	59	

Page 6

64	61	62	63	64	65
65	66	67	68	69	70
66	71	72	73	74	75
67	1	2	3	4	5
68	6	7	8	9	10
69	11	12	13	14	15
70	16	17	18	19	20
71	21	22	23	24	25
72	26	27	28	29	
73	31	32	33	34	35
74	36	37	38	39	40
75	41	42	43	44	45
76	46	47	48	49	50
77	51	52	53	54	55
78	56	57	58	59	60
79	61	62	63	64	65
80	66	67	68	69	70

NOTE. *This Answer Sheet is not intended for machine scoring.*

1 Which one of the five words below comes first in the dictionary?
(1) **mound** (2) **organ** (3) **house** (4) **elder** (5) **pound**

2 The opposite of increase is —
(6) **die** (7) **decrease** (8) **grow** (9) **crease** (10) **expand**

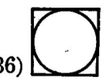
3 Cold is to a refrigerator the same as heat is to —
(11) **the weather** (12) **hot** (13) **a stove** (14) **a kitchen** (15) **ice**

4 Glass is to a window as cement is to —
(16) **sand** (17) **a sidewalk** (18) **hard** (19) **a door** (20) **transparent**

5 If Carol is shorter than Ethel and Ethel is the same height as Mabel, then Mabel is (?) Carol.
(21) **shorter than** (22) **the same height as** (23) ***cannot say which*** (24) **taller than**

6 The opposite of marriage is —
(26) **love** (27) **birth** (28) **divorce** (29) **death** (30) **hate**

7 The elbow is to the arm as the knee is to the —
(31) **shoulder** (32) **leg** (33) **toes** (34) **foot** (35) **ankle**

8 Three of the four designs at the right are alike in some way. Which one is not like the other three?
(36)  (37)  (38)  (39) 

9 Four of these things are alike in some way. Which is the one not like the other four?
(41) **a pear** (42) **a grape** (43) **a lemon** (44) **an onion** (45) **a prune**

10 Which answer tells best what a rake is?
(46) **a machine** (47) **a tool** (48) **a utensil** (49) **a thing** (50) **furniture**

11 A basket is to eggs as an envelope is to —
(51) **a handle** (52) **oranges** (53) **a stamp** (54) **a letter** (55) **the mailman**

12 Which of the five words below comes first in the dictionary?
(56) **cream** (57) **clock** (58) **crowd** (59) **climb** (60) **clear**

13 What is the most important reason that parents send their children to school?
(61) **It is fun for the children.** (62) **The teachers need employment.**
(63) **It is customary.** (64) **Parents know that educated persons live better.**
(65) **Parents need a rest from their children.**

14 A place that is free from filth or infection is said to be —
(66) **regulated** (67) **sanitary** (68) **contagious** (69) **a resort** (70) **a spa**

15 The opposite of death is —
(71) **grave** (72) **coffin** (73) **sleep** (74) **birth** (75) **waking**

16 Three of the four designs at the right are alike in some way. Which one is not like the other three?
(76)  (77)  (78)  (79) 

17 A general is to the army as an admiral is to the —
(81) **commander** (82) **war** (83) **navy** (84) **ocean** (85) **stars and stripes**

18 A trail is to a (?) as a track is to a train.
(86) **mountain** (87) **hiker** (88) **woods** (89) **locomotive** (90) **milkman**

19 If the following words were rearranged to make the best sentence, with what letter would the *last* word of the sentence begin?
girls large the a butterfly caught yellow
(91) **g** (92) **c** (93) **b** (94) **y** (95) **l**

20 The opposite of wide is —
(1) **thin** (2) **narrow** (3) **tall** (4) **small** (5) **low**

21 The earth (?) on its axis. (Choose the best word.)
(6) **spins** (7) **moves** (8) **vibrates** (9) **rotates** (10) **evolves**

22 Hay is to a horse as (?) is to a man.
(11) **grass** (12) **bread** (13) **a house** (14) **clothing** (15) **a bed**

23 Which of the five persons below is most like a lawyer, a minister, and a doctor?
(16) **a clerk** (17) **an agent** (18) **a carpenter** (19) **a professor** (20) **a milkman**

24 What is to water as eat is to food?
(21) **sleep** (22) **work** (23) **a glass** (24) **drink** (25) **milk**

25 The opposite of earn is —
(26) **make** (27) **money** (28) **take** (29) **spend** (30) **work**

26 Which one of the five words below comes *last* in the dictionary?
(31) **trees** (32) **three** (33) **labor** (34) **lumpy** (35) **rhyme**

27 Which tells best what a door is?
(36) **It is a movable part to close the entrance to a house.**
(37) **It is something you can shut or open.** (38) **It is something to go through.**
(39) **It swings on hinges.** (40) **You lock it at night.**

28 If the following words were rearranged to make the best sentence, with what letter would the *last* word of the sentence begin?
plaster made often of are walls
(41) **a** (42) **m** (43) **p** (44) **w** (45) **o**

29 If the following were arranged in order, which one would be in the middle?
(46) **hut** (47) **skyscraper** (48) **house** (49) **mansion** (50) **cabin**

30 Three of the four designs at the right are alike in some way. Which one is not like the other three?
(51)  (52)  (53)  (54) 

31 Which of the sentences below tells best what a puppy is?
(56) **It wags its tail.** (57) **It is a playful animal.** (58) **It is a small animal with four legs.**
(59) **It barks and has fur.** (60) **It is a young dog.**

32 If oranges are 6 for a quarter, how much will two dozen oranges cost?
(61) **24¢** (62) **60¢** (63) **72¢** (64) **$1.00** (65) **$1.50**

33 If Helen is older than Grace and Helen is younger than Alice, then Alice is (?) Grace.
(66) **younger than** (67) **older than** (68) **the same age as** (69) ***cannot say which***

34 If the following words were rearranged to make the best sentence, with what letter would the *last* word of the sentence begin?
twigs a gathers bird nest its for
(71) **t** (72) **g** (73) **b** (74) **n** (75) **f**

35 Which of the five things below is most like a violin, a flute, and a cornet?
(76) **a radio** (77) **a saxophone** (78) **a phonograph** (79) **a drum** (80) **music**

36 The carbon copy of a letter is said to be —
(81) **a carbonate** (82) **a counterfeit** (83) **a duplicate** (84) **an imitation** (85) **a multiple**

37 Which of the following is most like an orange, a banana, and a prune?
(1) **a tree** (2) **a peach** (3) **a peel** (4) **a nut** (5) **food**

38 Which of the five words below does not belong with the others?
(6) **tall** (7) **honest** (8) **strong** (9) **healthy** (10) **handsome**

39 One number is wrong in the following series. What should that number be?
8 1 7 1 6 1 5 1 4 1 3 1 2 1 0 1
(11) **2** (12) **3** (13) **1** (14) **4** (15) **5**

40 A man drove 7 miles east from his home and then drove 2 miles west. He was then (?) of his home.
(16) **5 miles east** (17) **5 miles west** (18) **9 miles east** (19) **9 miles west**

41 If the following words were rearranged to make the best sentence, with what letter would the *last* word in the sentence begin?
up dictionary we in words look the
(21) **w** (22) **u** (23) **d** (24) **l** (25) **i**

42 Which of the five things below is most like a key, a penny, and a bolt?
(26) **a dollar bill** (27) **a door** (28) **a purse** (29) **a spoon** (30) **a plate**

43 Count each 6 that has an 8 next after it in this row.
8 6 3 6 8 5 7 6 9 8 6 3 5 8 6 6 8 7 9 6 9 8 7 2 6 5 6 8 8 6 2 2 8 8 6 8
How many are there?
(31) **1** (32) **4** (33) **2** (34) **3** (35) **5**

44 A photograph is 3 inches wide and 5 inches long. If it is enlarged to be 20 inches long, how wide will it be?
(36) **8 in.** (37) **18 in.** (38) **15 in.** (39) **12 in.** (40) **30 in.**

45 Which of the five things below is most like a kite, a doll, and a marble?
(41) **a string** (42) **a dress** (43) **candy** (44) **a ball** (45) **a picture**

46 There is a saying, "Spare the rod and spoil the child." It means —
(46) **Never punish a child.** (47) **Children will be spoiled if never punished.**
(48) **Punishing spoils children.** (49) **Never use a rod to punish a child.**

47 Animal is to horse as (?) is to carrot.
(51) **rabbit** (52) **monkey** (53) **dinner** (54) **vegetable** (55) **yellow**

48 Edward is stronger than Charles and Charles is stronger than William. Therefore, Edward is (?) William.
(56) **not so strong as** (57) **stronger than** (58) **just as strong as**
(59) ***cannot say which***

49 In the alphabet, which letter follows the letter that comes next after H?
(61) **F** (62) **G** (63) **J** (64) **H** (65) **I**

50 Three of the four designs at the right are alike in some way. Which one is not like the other three?
(66)  (67)  (68)  (69) 

51 A bed always has —
(71) **a mattress** (72) **length** (73) **a pillow** (74) **sheets** (75) **springs**

52 The bark of a tree is to the tree as the peeling of a banana is to the —
(1) **banana tree** (2) **banana skin** (3) **bark of a dog** (4) **banana**
(5) **leaf of the tree**

53 The inventor is to the machine as the discoverer is to the —
(6) **invention** (7) **machine shop** (8) **finder** (9) **machinist** (10) **north pole**

54 Which tells best what a store is?
(11) **a place to buy things** (12) **a place with display windows**
(13) **a place where people work** (14) **a place where goods are sold** (15) **a warehouse**

55 Backward is to forward as northeast is to —
(16) **northwest** (17) **going** (18) **direction** (19) **southeast** (20) **southwest**

56 Which tells best what an estimate is?
(21) **a partially correct answer** (22) **a wrong answer** (23) **a blueprint**
(24) **an exact computation** (25) **a rough approximation**

57 If the following were arranged in order, which one would be in the middle?
(26) **finger** (27) **palm** (28) **wrist** (29) **shoulder** (30) **elbow**

58 A machine that is made up of many parts is said to be —
(31) **contrary** (32) **complicated** (33) **numerous** (34) **fractional** (35) **mechanical**

59 There is a saying, "An eye for an eye and a tooth for a tooth." It means —
(36) **Changing eyes and teeth.** (37) **Fitting a person with an artificial eye or tooth.**
(38) **Getting even by paying back in the same way.**
(39) **Using things for the purpose they have been made.**

60 An event that is quite likely to happen is said to be —
(41) **certain** (42) **possible** (43) **doubtful** (44) **impossible** (45) **probable**

61 A teacher should never (?) a pupil because of his mistakes.
(46) **detain** (47) **blame** (48) **excuse** (49) **ridicule** (50) **help**

62 There is a saying, "He laughs best who laughs last." It means —
(51) **Laughter gets better and better.**
(52) **A person may laugh and then be laughed at because he was wrong.**
(53) **It is better to wait before you laugh.** (54) **The longer you laugh the funnier it is.**

63 Three of the four designs at the right are alike in some way. Which one is not like the other three?
(56)  (57)  (58)  (59) 

(Go on to the next page.)

64 Best is to good as (?) is to bad.
(61) **least** (62) **worse** (63) **very bad** (64) **worst** (65) **terrible**

65 If each 8 in the following row were changed to a 9 and each 7 dropped out, the seventh 9 would be followed by what number? (Do not mark the paper.)
7 9 5 9 8 5 6 9 8 7 9 8 7 8 6 9 9 9 5
(66) **5** (67) **6** (68) **7** (69) **9** (70) **8**

66 In a certain row of trees one tree is the sixth from each end of the row. How many trees are there in the row?
(71) **6** (72) **11** (73) **10** (74) **12** (75) **13**

67 A pupil who is required to leave school temporarily because of misconduct is said to be —
(1) **expelled** (2) **discontinued** (3) **suspended** (4) **reprimanded** (5) **dismissed**

68 If I have a large box with 4 small boxes in it and 4 very small boxes in each small box, how many boxes do I have in all?
(6) **3** (7) **9** (8) **21** (9) **16** (10) **20**

69 Which of the five words below is most like soft, warm, and brown?
(11) **color** (12) **baby** (13) **feeling** (14) **fat** (15) **cotton**

70 Which of these series contains a wrong number?
(16) **1–3–5–7–9** (17) **2–4–6–8–10** (18) **2–5–8–11–14** (19) **1–4–7–10–13**
(20) **3–6–9–12–14**

71 Which of the following is the most important reason that many persons buy on the installment plan?
(21) **They don't like to handle a large sum of money.**
(22) **They wish to use the article before they have enough money to pay for it in full.**
(23) **It is cheaper.** (24) **It is more convenient and helps people save money.**

72 When the time by a clock was 9 minutes past 10, the hands were interchanged. The clock then said about —
(26) **9 minutes past 1** (27) **9 minutes of 11** (28) **9 minutes past 2** (29) **9 minutes of 2**

73 If a statement exactly corresponds with what happened, it is said to be —
(31) **a prevarication** (32) **a communication** (33) **the truth** (34) **an account**
(35) **an accusation**

74 One number is wrong in the following series. What should that number be?
1 2 4 8 16 32 64 96 256
(36) **6** (37) **12** (38) **24** (39) **128** (40) **48**

75 Which tells best what an exaggeration is?
(41) **a lie** (42) **a wrong answer** (43) **an overstatement** (44) **an understatement**
(45) **a false statement**

76 What letter in the following series appears a third time nearest the beginning?
V X Z W Y Y Z V W X W Z X V Y V W X Y Z
(46) **V** (47) **X** (48) **Y** (49) **Z** (50) **W**

77 One number is wrong in the following series. What should that number be?
1 8 2 7 3 8 4 7 5 8 6 7 7 8 8 8
(51) **9** (52) **8** (53) **7** (54) **6** (55) **5**

78 There is a saying, "Handsome is as handsome does." It means —
(56) **Good-looking people do pretty things.** (57) **Being and doing are about the same.**
(58) **People who do nice things seem good-looking.**
(59) **Handsome people do the same as others.**

79 If the following were arranged in order, which would be in the middle?
(61) **grandmother** (62) **sister** (63) **granddaughter** (64) **aunt** (65) **niece**

80 In a foreign language, *karo lupi tana* means *pretty little girl; karo sali* means *big girl;* and *lupi neka* means *pretty good.* What word means *little?*
(66) **karo** (67) **lupi** (68) **sali** (69) **tana** (70) **neka**

The Gray-Votaw-Rogers

GENERAL ACHIEVEMENT TESTS

FORM Q

ADVANCED TEST

FOR GRADES 7—9

By

HOB GRAY
The University of Texas

DAVID F. VOTAW
Southwest Texas State Teachers College

J. LLOYD ROGERS
Southwest Texas State Teachers College

Name ..... *Grade* ..... *Boy or Girl?* .....

Date ..... *What is your age?* .....

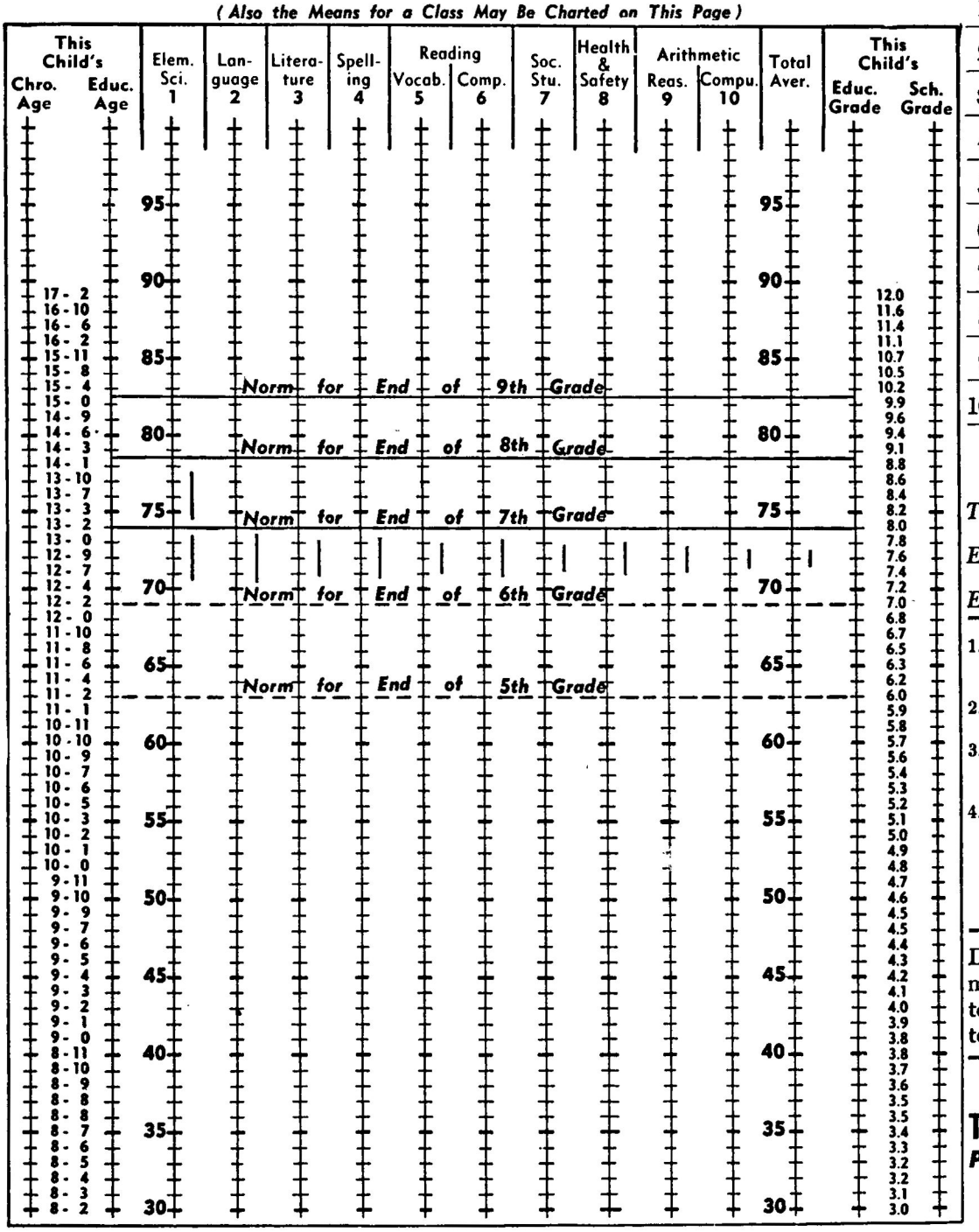
When is your next birthday? .....

Name of your town or district: .....

Name of your building: .....

INDIVIDUAL EDUCATIONAL CHART

(Also the Means for a Class May Be Charted on This Page)



TEST	SCORE
1. Elemen. Science	
2. Language	
3. Literature	
4. Spelling	
5. Reading: Vocab.	
6. Reading: Comp.	
7. Social Studies	
8. Health & Safety	
9. Arith. Reas.	
10. Arith. Compu.	
	10)

Total Average .....

Educational Grade .....

Educational Age .....

1. The educational grade and age scales on this Profile Chart indicate the norms for this test.
2. Ages above 14—2 and below 8—2 are extrapolated.
3. The short vertical lines are probable errors of the estimated true scores.
4. The scale of scores for all of the tests has been equated. Thus uniform achievement will be indicated for a child if the line connecting his ten score-points is approximately horizontal.

DIRECTIONS given in the manual must be followed in administering this test if the results are to be compared with the norms.

THE STECK COMPANY
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TEST 1. ELEMENTARY SCIENCE

DIRECTIONS: **Find the answer that you believe makes the statement true and then place an X in the square at the right that is numbered the same as the answer you choose. Do not skip any of the items.**

EXAMPLE: A turkey is a 1 fish 2 fowl 3 plant. .....

ANSWERS		
1	2	3
☐	☒	☐

	ANSWERS		
	1	2	3
1. The engine of an automobile is run by 1 steam 2 crude oil 3 gasoline.	☐	☐	☐
2. An X-ray machine takes pictures of 1 clouds 2 bones 3 colors.	☐	☐	☐
3. Linen is made from 1 wool 2 flax 3 hair.	☐	☐	☐
4. The earth gets its warmth from the 1 planets 2 moon 3 sun.	☐	☐	☐
5. Wooden furniture can be preserved by the use of 1 sandpaper 2 alcohol 3 varnish.	☐	☐	☐
6. The rainbow is sunlight refracted by 1 dust 2 raindrops 3 atmosphere.	☐	☐	☐
7. The principal food of song birds is 1 grain 2 insects 3 fruit.	☐	☐	☐
8. The smallest forms of plant life and animal life are observed through a 1 microscope 2 telescope 3 stereoscope.	☐	☐	☐
9. The vitamins in our foods improve our 1 digestion 2 knowledge 3 intelligence.	☐	☐	☐
10. Electricity is a flow of 1 electrons 2 armatures 3 commutators.	☐	☐	☐
11. A tornado is a 1 snowstorm 2 cyclone 3 destructive whirlwind.	☐	☐	☐
12. The rotation of the earth upon its axis causes 1 day and night 2 seasons 3 winds.	☐	☐	☐
13. Plants take up carbon dioxide and give off 1 carbon 2 chlorine 3 oxygen.	☐	☐	☐
14. Sulphur is used in making 1 disinfectants 2 foods 3 paints.	☐	☐	☐
15. Coal is formed from 1 buried plants 2 sea shells 3 bones.	☐	☐	☐
16. A gas gauge may be used to measure the pressure of 1 air 2 water 3 brakes.	☐	☐	☐
17. A barometer is used to determine 1 wind speed 2 ocean temperature 3 air pressure.	☐	☐	☐
18. A constellation is a group of 1 planets 2 stars 3 moons.	☐	☐	☐

(GO ON TO NEXT PAGE)

	1	2	3
19. When air is heated, it 1 contracts 2 expands 3 remains unchanged.	☐	☐	☐
20. A spider has 1 four legs 2 six legs 3 eight legs.	☐	☐	☐
21. The steam engine was invented by 1 Bell 2 Watt 3 Edison.	☐	☐	☐
22. The chief treatment of crude oil for separation of its parts is called 1 aeration 2 distillation 3 watering.	☐	☐	☐
23. The longest period of time for which accurate weather predictions may be made for a given community is about 1 two days 2 two months 3 two years.	☐	☐	☐
24. When coal is distilled without exposure to air, the product left is 1 benzene 2 petroleum 3 coke.	☐	☐	☐
25. The number of sound vibrations per second which produces high pitch is 1 many 2 medium 3 few.	☐	☐	☐
26. Fertile soil contains an abundance of 1 oxides 2 alkalies 3 humus.	☐	☐	☐
27. The heat of vaporization is the calories required to vaporize 1 alcohol 2 water 3 gasoline.	☐	☐	☐
28. Carbon black is used in 1 varnish 2 paint 3 glue.	☐	☐	☐
29. Anthracite coal is 1 soft 2 powdered 3 hard.	☐	☐	☐
30. Stalagmites are found in 1 rivers 2 mountains 3 caves.	☐	☐	☐
31. In the spring many birds fly 1 north 2 south 3 west.	☐	☐	☐
32. The ill effect of disease may be lessened by the use of 1 atomizers 2 serums 3 parasites.	☐	☐	☐
33. Oil or petroleum that is found in oil wells was made by 1 rocks and metals 2 water and gases 3 plants and animals.	☐	☐	☐
34. Nuclear energy is derived from 1 atoms 2 coal 3 water.	☐	☐	☐
35. The earth is closer to the sun than is 1 Mars 2 Venus 3 Mercury.	☐	☐	☐
36. Compared with the earth as to size, most stars are 1 smaller 2 larger 3 the same size.	☐	☐	☐
37. In vaporization, a liquid changes to 1 gas 2 solid matter 3 another liquid.	☐	☐	☐

(GO ON TO NEXT PAGE)

	1	2	3
38. Microorganisms include such life as 1 vegetables 2 molds 3 tadpoles.	☐	☐	☐
39. The calorie is a unit of 1 heat 2 force 3 power.	☐	☐	☐
40. Limestone is a 1 nitrate 2 carbonate 3 silicate.	☐	☐	☐
41. Light or heat is absorbed most readily by an object which is painted 1 black 2 gray 3 white.	☐	☐	☐
42. One coal-tar product is 1 dye 2 aluminum 3 sodium.	☐	☐	☐
43. If the rooms of a house are easy to keep comfortably warm in winter, snow or frost on the roof will melt 1 rapidly 2 slowly 3 at a moderate rate.	☐	☐	☐
44. One of the products of the growth of yeast is 1 oxygen 2 hydrogen 3 carbon dioxide.	☐	☐	☐
45. A photoelectric cell is sensitive to 1 light 2 heat 3 pressure.	☐	☐	☐
46. The sun is directly above the equator about 1 June 21 2 September 21 3 December 21.	☐	☐	☐
47. The whale is a 1 mammal 2 fish 3 crustacean.	☐	☐	☐
48. The use of a wheel and axle is to gain 1 speed 2 force 3 mechanical advantage.	☐	☐	☐
49. The number of parts of an insect's body is 1 six 2 four 3 three.	☐	☐	☐
50. Dew starts to form when the relative humidity of the air rises to 1 50% 2 75% 3 100%.	☐	☐	☐

No. Right..... *Score*.....

No. right	0–14
Score	40

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
42	45	48	51	54	57	60	62	65	67	69	70	71	73	75	78	80	82	84	85	87	88	89	90	91	92	93	94	95	95	96	97	98	98	99	99

TEST 2. LANGUAGE

DIRECTIONS: **If you choose the upper word, phrase, or punctuation marks, place an X in the first square at the right of the page; if you choose the lower, place the X in the second square. Do not skip any of the items.**

EXAMPLES:

a The boys $\begin{matrix}1\ \text{is}\\2\ \text{are}\end{matrix}$ playing ball. ..... ANSWERS: 1 ☐ 2 ☒

b The month of $\begin{matrix}1\ \text{May}\\2\ \text{may}\end{matrix}$ brings flowers. ..... 1 ☒ 2 ☐

c When did you $\begin{matrix}1\ \text{come.}\\2\ \text{come?}\end{matrix}$ ..... 1 ☐ 2 ☒

1. Tom's friends $\begin{matrix}1\ \text{saw}\\2\ \text{seen}\end{matrix}$ him whitewashing the fence.	1 ☐	2 ☐
2. $\begin{matrix}1\ \text{May}\\2\ \text{Can}\end{matrix}$ I use your eraser?	1 ☐	2 ☐
3. Silver will soon outrun $\begin{matrix}1\ \text{them}\\2\ \text{those}\end{matrix}$ other horses.	1 ☐	2 ☐
4. The children in the hospital $\begin{matrix}1\ \text{took}\\2\ \text{taken}\end{matrix}$ special interest in the dolls.	1 ☐	2 ☐
5. The captains had already $\begin{matrix}1\ \text{chosen}\\2\ \text{chose}\end{matrix}$ the best spellers.	1 ☐	2 ☐
6. There $\begin{matrix}1\ \text{is}\\2\ \text{are}\end{matrix}$ thirty days in September.	1 ☐	2 ☐
7. The fourth grade $\begin{matrix}1\ \text{sang}\\2\ \text{sung}\end{matrix}$ as if they enjoyed singing.	1 ☐	2 ☐
8. It $\begin{matrix}1\ \text{doesn't}\\2\ \text{don't}\end{matrix}$ seem any time since last Christmas.	1 ☐	2 ☐
9. Longfellow often read to his daughters what he had $\begin{matrix}1\ \text{wrote.}\\2\ \text{written.}\end{matrix}$	1 ☐	2 ☐
10. Just outside my window $\begin{matrix}1\ \text{was}\\2\ \text{were}\end{matrix}$ two robins.	1 ☐	2 ☐
11. The lovely bubble $\begin{matrix}1\ \text{burst}\\2\ \text{bursted}\end{matrix}$ when it touched the floor.	1 ☐	2 ☐
12. No one likes cake better than $\begin{matrix}1\ \text{I.}\\2\ \text{me.}\end{matrix}$	1 ☐	2 ☐
13. You $\begin{matrix}1\ \text{weren't}\\2\ \text{wasn't}\end{matrix}$ supposed to open the book.	1 ☐	2 ☐
14. The boy scouts have brought $\begin{matrix}1\ \text{their}\\2\ \text{there}\end{matrix}$ equipment.	1 ☐	2 ☐
15. Some boys $\begin{matrix}1\ \text{stole}\\2\ \text{swiped}\end{matrix}$ fruit from Mr. Hardy's orchard.	1 ☐	2 ☐
16. $\begin{matrix}1\ \text{Us boys}\\2\ \text{We boys}\end{matrix}$ liked the new pupil.	1 ☐	2 ☐
17. It seemed $\begin{matrix}1\ \text{rather}\\2\ \text{kind of}\end{matrix}$ queer that no one was at home.	1 ☐	2 ☐
18. Every dollar we have $\begin{matrix}1\ \text{gave}\\2\ \text{given}\end{matrix}$ to the Red Cross has been used wisely.	1 ☐	2 ☐
19. Margaret Mitchell wrote $\begin{matrix}1\ \text{Gone with the Wind.}\\2\ \text{"Gone with the Wind."}\end{matrix}$	1 ☐	2 ☐

(GO ON TO NEXT PAGE)

		1	2
20.	A cowboy loves his horse and treats him 1 well. 2 good.	☐	☐
21.	It is a good idea to 1 lie 2 lay down and rest after dinner.	☐	☐
22.	The people 1 could 2 coudn't hardly believe that Arthur should be their king.	☐	☐
23.	If apples are 1 shaken 2 shook from the tree, they get bruised.	☐	☐
24.	Jim's sore foot was hurting 1 considerable. 2 considerably.	☐	☐
25.	1 The south 2 The South is noted for its hospitality.	☐	☐
26.	Here is a picture of Junius and 1 Julius our 2 Julius, our twin calves.	☐	☐
27.	Children should learn to defend 1 theirselves. 2 themselves.	☐	☐
28.	The baby thinks 1 its 2 it's fun to play in the sandpile.	☐	☐
29.	Leonard's horse has a 1 lose 2 loose shoe.	☐	☐
30.	Bob would not tell where the ball 1 was. 2 was at.	☐	☐
31.	Margaret, please come 1 in 2 into the house and help me.	☐	☐
32.	I went to the museum with 1 John, and 2 John and Robert took Father for a walk.	☐	☐
33.	The king granted favors to 1 whoever 2 whomever flattered him.	☐	☐
34.	It was 1 they 2 them who captured the bandits.	☐	☐
35.	Have you anything 1 farther 2 further to say?	☐	☐
36.	Sarah's new hat is 1 nice. 2 becoming.	☐	☐
37.	Please mail your answer to Hazel or 1 me. 2 myself.	☐	☐
38.	I 1 advise 2 advice you to study your lesson.	☐	☐
39.	Good citizenship is 1 loyalty 2 when you are loyal to your country.	☐	☐
40.	"It matters not 1 who 2 whom I am," said the stranger.	☐	☐
41.	1 You aren't 2 One isn't hanged nowadays for such things as stealing a loaf of bread.	☐	☐
42.	The recipe calls for one pound of 1 sugar, which 2 sugar; which is the same as two cups.	☐	☐
43.	Some children would like 1 to never eat 2 never to eat vegetables.	☐	☐

(GO ON TO NEXT PAGE)

		1	2
44.	When mother heard the noise, she asked 1 "What it was?" 2 what it was.	☐	☐
45.	Did the medicine have any unpleasant 1 affects 2 effects on the patient?	☐	☐
46.	Anne could not decide 1 who 2 whom to invite to her party.	☐	☐
47.	His mother will be 1 eager 2 anxious about his safety until she hears from him.	☐	☐
48.	Our state 1 capital 2 capitol is a beautiful building.	☐	☐
49.	The opportunities of others seem better than 1 ours. 2 our's.	☐	☐
50.	My little brother begged Walter and 1 I 2 me to let him go with us.	☐	☐
51.	There 1 has been 2 have been many stories told of Buffalo Bill's adventures.	☐	☐
52.	Anyone who really loves 1 his 2 their country will obey its laws.	☐	☐
53.	You 1 set 2 sat the bowl on the wrong shelf.	☐	☐
54.	Frances never gets tired of 1 those 2 that kind of stories.	☐	☐
55.	Someone stepped between 1 him and me. 2 he and I.	☐	☐
56.	A list of twenty names 1 was 2 were written on the blackboard.	☐	☐
57.	Frances 1 has 2 hasn't been absent but two days this year.	☐	☐
58.	Neither fire nor flood 1 was 2 were able to stop the Pony Express.	☐	☐
59.	The boy has had careful 1 raising. 2 rearing.	☐	☐
60.	The pupils were 1 enthused 2 enthusiastic over the essay contest.	☐	☐

No. Right..... *Score*.....

No. right...	0-26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Score.....	40	42	45	47	49	51	54	56	58	60	63	65	66	68	70	72	74	76	80	83	85	87	89	90	91	92	93	94	95	96	96	97	98	98	99

TEST 3. LITERATURE

DIRECTIONS: Each sentence has four answers which are numbered 1, 2, 3, and 4, but only one of the answers is correct. Read each sentence carefully and select the answer that you believe to be the correct one. Then place an X in the square at the right that has the same number as the answer you selected. Do not skip any sentences.

EXAMPLE: Captain Kidd was a famous
1 soldier 2 king 3 pirate 4 writer. .....

ANSWERS

1	2	3	4
☐	☐	☒	☐

1. Peter and Barbara Ann Brandon
1 explored an island 2 traveled with a circus
3 visited their uncle's ranches 4 won a tennis tournament. .....

1	2	3	4
☐	☐	☐	☐

2. Tom Sawyer's half-brother was named 1 Sidney 2 Jim 3 Joe 4 Walter. ....

1	2	3	4
☐	☐	☐	☐

3. A man who understood the language of the animals was
1 Dr. Dolittle 2 the Raggedy Man 3 Johnny Appleseed 4 the Pied Piper.

1	2	3	4
☐	☐	☐	☐

4. Clement C. Moore wrote
1 *A Visit from Saint Nicholas* 2 *Why the Chimes Rang*
3 *Heidi* 4 *The Wizard of Oz.* .....

1	2	3	4
☐	☐	☐	☐

5. Huckleberry Finn was a companion of
1 Penrod 2 Hans Brinker 3 Tom Sawyer 4 Jim Hawkins. .....

1	2	3	4
☐	☐	☐	☐

6. Sunnybank was the home of
1 Washington Irving 2 the Moffat family
3 a collie dog named Lad 4 the Little Colonel. .....

1	2	3	4
☐	☐	☐	☐

7. "The cinema" is another name for
1 pottery-making 2 literary criticism 3 motion pictures 4 light opera. ....

1	2	3	4
☐	☐	☐	☐

8. A battle between a father and son is the chief incident in
1 *Silas Marner* 2 *Richard Carvel*
3 *The Ancient Mariner* 4 *Sohrab and Rustum.* .....

1	2	3	4
☐	☐	☐	☐

9. In the poem "The Raven," a word which occurs very often is
1 dusky 2 alone 3 forever 4 nevermore. .....

1	2	3	4
☐	☐	☐	☐

10. The word "Pharaoh" suggests 1 India 2 Egypt 3 Assyria 4 Crete. .....

1	2	3	4
☐	☐	☐	☐

11. In his poem "Loveliest of Trees," A. E. Housman writes of the
1 maple tree 2 almond tree 3 cherry tree 4 ebony tree. .....

1	2	3	4
☐	☐	☐	☐

12. Toby Tyler spent ten weeks
1 on a whaling boat 2 on a plantation 3 with an Indian tribe 4 with a circus.

1	2	3	4
☐	☐	☐	☐

13. Laura Ingalls Wilder wrote mostly of
1 Latin-Americans 2 jungle tribes
3 pioneer days in America 4 the American Revolution. .....

1	2	3	4
☐	☐	☐	☐

14. Abou ben Adhem was visited by
1 a priest 2 an angel 3 a raven 4 his father's spirit. .....

1	2	3	4
☐	☐	☐	☐

15. The Hardy boys lived in 1 Lanesville 2 Chester 3 Benton 4 Bayport. ....

1	2	3	4
☐	☐	☐	☐

(GO ON TO NEXT PAGE)

16. Will James excels as a writer of stories about
1 horses 2 sea voyages 3 wild animals 4 Southern mountaineers. ..... 1 2 3 4 ☐ ☐ ☐ ☐

17. A notable American actress is
1 Sarah Bernhardt 2 Katharine Cornell
3 Dorothy Thompson 4 Clare Boothe Luce. ..... 1 2 3 4 ☐ ☐ ☐ ☐

18. Grantland Rice is an authority in the field of
1 aeronautics 2 sports 3 superstitions 4 news writing. ..... 1 2 3 4 ☐ ☐ ☐ ☐

19. A story which leaves the reader to decide the ending is
1 *The Purloined Letter* 2 *The Ransom of Red Chief*
3 *The Lady or the Tiger* 4 *The Revolt of Mother.* ..... 1 2 3 4 ☐ ☐ ☐ ☐

20. In *Crossing the Bar,* Tennyson expresses his feelings about
1 growing old 2 sea travel 3 death 4 riches. ..... 1 2 3 4 ☐ ☐ ☐ ☐

21. The Vicar of Wakefield was
1 Dr. Primrose 2 Brother Jonathan 3 Father Felician 4 Dr. Dolittle. ..... 1 2 3 4 ☐ ☐ ☐ ☐

22. Commander Richard Byrd tells of his flight over the North Pole in
1 *Sky Pilot* 2 *Skyward* 3 *Wings* 4 *Night Flight.* ..... 1 2 3 4 ☐ ☐ ☐ ☐

23. Music and story are combined in
1 a symphony 2 an opera 3 an overture 4 a sonata. ..... 1 2 3 4 ☐ ☐ ☐ ☐

24. Mrs. Wiggs of the Cabbage Patch gave her three daughters the names of
1 flowers 2 characters in the Bible 3 seasons of the year 4 continents. ..... 1 2 3 4 ☐ ☐ ☐ ☐

25. O. Henry's short stories are noted for their
1 humor and surprise endings 2 use of weird settings
3 moral teachings 4 sympathy for the poor and oppressed. ..... 1 2 3 4 ☐ ☐ ☐ ☐

26. Gessler was the enemy of
1 Robin Hood 2 Ivanhoe 3 William Tell 4 the Black Prince. ..... 1 2 3 4 ☐ ☐ ☐ ☐

27. A well-known version of the Bible bears the name of the English King
1 Charles 2 Richard 3 Edward 4 James. ..... 1 2 3 4 ☐ ☐ ☐ ☐

28. Three sisters who were English writers were the
1 Brontës 2 Alcotts 3 Barretts 4 Austens. ..... 1 2 3 4 ☐ ☐ ☐ ☐

29. The detective in novels by S. S. Van Dine is
1 Sherlock Holmes 2 Hercule Poirot 3 Nero Wolfe 4 Philo Vance. ..... 1 2 3 4 ☐ ☐ ☐ ☐

30. The Bridge of San Luis Rey was in 1 Panama 2 Mexico 3 Portugal 4 Peru. 1 2 3 4 ☐ ☐ ☐ ☐

31. *Green and Gold* tells the story of
1 the butterfly 2 the peacock 3 the banana 4 the orange. ..... 1 2 3 4 ☐ ☐ ☐ ☐

32. Young Lochinvar went to Netherby Hall to
1 fight a duel 2 join the king's guard
3 enter an archery contest 4 carry away a bride. ..... 1 2 3 4 ☐ ☐ ☐ ☐

33. The hero who found the Golden Fleece was
1 Jason 2 Orpheus 3 Hercules 4 Ulysses. ..... 1 2 3 4 ☐ ☐ ☐ ☐

(GO ON TO NEXT PAGE)

		1	2	3	4
34.	Dogs and Eskimos were favorite topics of 1 Mark Twain 2 Robert Louis Stevenson 3 Jack London 4 Booth Tarkington.	☐	☐	☐	☐
35.	*Cimarron* is the story of the rush for land in 1 California 2 Ohio 3 Nebraska 4 Oklahoma.	☐	☐	☐	☐
36.	The gift Prometheus gave to man was 1 music 2 fire 3 wisdom 4 the seasons.	☐	☐	☐	☐
37.	The Lilliputians were 1 giants 2 tiny people 3 men with heads of animals 4 famous explorers.	☐	☐	☐	☐
38.	The wife of Cupid was 1 Persephone 2 Daphne 3 Psyche 4 Alcestis.	☐	☐	☐	☐
39.	Because he said, "I wish I may never hear of the United States again," Philip Nolan spent the remainder of his life 1 aboard ship 2 in France 3 on a desert island 4 in a prison.	☐	☐	☐	☐
40.	The author of *The Red Badge of Courage* is 1 George W. Cable 2 Stephen Crane 3 Daniel Defoe 4 Walter Edmonds.	☐	☐	☐	☐
41.	Christian and Hopeful are characters in 1 *Gulliver's Travels* 2 *The Pilgrim's Progress* 3 *Ivanhoe* 4 *Robinson Crusoe.*	☐	☐	☐	☐
42.	Ebenezer Scrooge changed his ways because he received a visit from 1 Marley's ghost 2 the Witch of the West 3 a child 4 a wandering minstrel.	☐	☐	☐	☐
43.	In *The Nutcracker Suite,* the nutcracker was made of 1 brass 2 copper 3 silver 4 gold.	☐	☐	☐	☐
44.	In *Treasure Island,* the treasure-seekers sailed aboard the 1 *Santa Maria* 2 *Admiral Benbow* 3 *Hispaniola* 4 *Triton.*	☐	☐	☐	☐
45.	The Deserted Village was named 1 Aurora 2 Auburn 3 Raveloe 4 Ware.	☐	☐	☐	☐
46.	Pecos Bill reminds the reader of 1 Ferdinand 2 Dr. Dolittle 3 Buffalo Bill 4 Paul Bunyan.	☐	☐	☐	☐
47.	Carcajou was a 1 wolverine 2 fox 3 coyote 4 crocodile.	☐	☐	☐	☐
48.	Harvey Cheyne is a character in 1 *Captains Courageous* 2 *The Spy* 3 *The Yearling* 4 *Wings.*	☐	☐	☐	☐
49.	The Swan Knight was 1 Lohengrin 2 Rhadames 3 Peer Gynt 4 Siegfried.	☐	☐	☐	☐
50.	*The Chambered Nautilus* describes 1 a stately palace 2 a phantom ship 3 a small sea creature 4 a flower.	☐	☐	☐	☐
51.	The hero of the Medieval Norse legends is 1 Siegfried 2 Roland 3 Arthur 4 Charlemagne.	☐	☐	☐	☐
52.	*Adam of the Road* is the story of 1 a band of gypsies 2 a medieval minstrel 3 the building of a railroad 4 a wise peddler.	☐	☐	☐	☐

No. Right..... *Score*.....

No. right	0-8	9	10	11	12	13	14
Score	44	48	51	54	57	60	64

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
66	69	72	74	76	78	80	82	83	85	86	88	89	90	90	91	91	91	92	92	92	93	93	94	94	94	95	95	95	95	96	96	97	97	97	98	98	99

TEST 4. SPELLING

Grades - - - 7 8 9

Number words credit to point of beginning - - 24 32 40

Number words spelled correctly - - - - - - .....

Sum - - - - - - .....

Score.....

Sum	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Score	40	44	46	48	49	51	52	53	54	55	56	58	59	60	61	62	63	64	65	65	66	67	68	69

48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
69	70	71	72	72	73	74	75	75	76	76	77	78	78	79	80	80	81	82	83	84	84	85	86	86	87	88	89	90	91	92	93	94	95	96	97	98	99

TEST 5. READING: VOCABULARY

DIRECTIONS: **Find the answer that you believe makes the statement true and then place an X in the square at the right that is numbered the same as the answer you chose. Do not skip any of the items.**

EXAMPLE: A *lad* is a 1 *girl* 2 *pony* 3 *boy* 4 *kitten.* .....

ANSWERS

	1	2	3	4
EXAMPLE:	☐	☐	☒	☐

		1	2	3	4
1.	A *feast* is a 1 *meal* 2 *race* 3 *giant* 4 *mountain.*	☐	☐	☐	☐
2.	A *library* has 1 *bottles* 2 *books* 3 *horns* 4 *tools.*	☐	☐	☐	☐
3.	A *reply* is an 1 *offer* 2 *idea* 3 *answer* 4 *opinion.*	☐	☐	☐	☐
4.	*Least* means 1 *smallest* 2 *last* 3 *closest* 4 *first.*	☐	☐	☐	☐
5.	*Simple* means 1 *silent* 2 *happy* 3 *single* 4 *easy.*	☐	☐	☐	☐
6.	A *university* is a 1 *ray* 2 *school* 3 *realm* 4 *pearl.*	☐	☐	☐	☐
7.	An *idea* is a 1 *picture* 2 *thought* 3 *story* 4 *knight.*	☐	☐	☐	☐
8.	*Pork* comes from 1 *sheep* 2 *goats* 3 *hogs* 4 *cows.*	☐	☐	☐	☐
9.	*Rage* refers to 1 *fever* 2 *laughter* 3 *records* 4 *anger.*	☐	☐	☐	☐
10.	*Ancient* means 1 *high* 2 *large* 3 *dark* 4 *old.*	☐	☐	☐	☐
11.	A *mansion* is a kind of 1 *family* 2 *residence* 3 *tribe* 4 *mountain.*	☐	☐	☐	☐
12.	A *dungeon* is a kind of 1 *burglar* 2 *bureau* 3 *prison* 4 *servant.*	☐	☐	☐	☐
13.	*Weary* means 1 *bare* 2 *weak* 3 *restless* 4 *tired.*	☐	☐	☐	☐
14.	To *explore* is to 1 *enter* 2 *examine* 3 *envy* 4 *reap.*	☐	☐	☐	☐
15.	To *reprove* is to 1 *restrain* 2 *separate* 3 *blame* 4 *revise.*	☐	☐	☐	☐
16.	A *convention* is an 1 *assembly* 2 *assurance* 3 *awakening* 4 *offense.*	☐	☐	☐	☐
17.	A *license* is a 1 *loan* 2 *gale* 3 *store* 4 *permit.*	☐	☐	☐	☐
18.	To *flee* is to 1 *dance* 2 *run* 3 *fall* 4 *forget.*	☐	☐	☐	☐
19.	*Remote* means 1 *distant* 2 *remarkable* 3 *religious* 4 *unkind.*	☐	☐	☐	☐
20.	A *raven* is a 1 *ship* 2 *bird* 3 *fox* 4 *emperor.*	☐	☐	☐	☐

(GO ON TO NEXT PAGE)

		1	2	3	4
21.	A *refrigerator* is a place for storing 1 *chinaware* 2 *gravel* 3 *food* 4 *soap.*	☐	☐	☐	☐
22.	*Artificial* means 1 *unreal* 2 *attractive* 3 *liberal* 4 *conscious.*	☐	☐	☐	☐
23.	*Mirth* means 1 *gladness* 2 *prayer* 3 *sickness* 4 *sin.*	☐	☐	☐	☐
24.	*Superior* means 1 *common* 2 *average* 3 *sufficient* 4 *greater.*	☐	☐	☐	☐
25.	*Doom* means 1 *grief* 2 *fame* 3 *fate* 4 *extreme.*	☐	☐	☐	☐
26.	A *tavern* is a kind of 1 *theater* 2 *tent* 3 *prison* 4 *hotel.*	☐	☐	☐	☐
27.	*Haughty* means 1 *healthful* 2 *harmful* 3 *proud* 4 *expectant.*	☐	☐	☐	☐
28.	To *comply* is to 1 *obey* 2 *confuse* 3 *conquer* 4 *meddle.*	☐	☐	☐	☐
29.	An *abode* is a 1 *mine* 2 *factory* 3 *dwelling* 4 *voyage.*	☐	☐	☐	☐
30.	To *entreat* is to 1 *engage* 2 *beseech* 3 *endure* 4 *envy.*	☐	☐	☐	☐
31.	To *avoid* is to 1 *tread* 2 *bribe* 3 *worry* 4 *shun.*	☐	☐	☐	☐
32.	To *abide* is to 1 *feast* 2 *advise* 3 *adore* 4 *remain.*	☐	☐	☐	☐
33.	An *address* is a 1 *speech* 2 *letter* 3 *song* 4 *dress.*	☐	☐	☐	☐
34.	*Mute* means 1 *naked* 2 *musical* 3 *kindly* 4 *silent.*	☐	☐	☐	☐
35.	*Custody* means 1 *resistance* 2 *ridicule* 3 *guardianship* 4 *investment.*	☐	☐	☐	☐
36.	To *expose* is to 1 *discover* 2 *direct* 3 *fade* 4 *disclose.*	☐	☐	☐	☐
37.	*Capacity* means 1 *generosity* 2 *ability* 3 *security* 4 *tyranny.*	☐	☐	☐	☐
38.	*Revengeful* means 1 *rebellious* 2 *vindictive* 3 *sportive* 4 *riotous.*	☐	☐	☐	☐
39.	A *dynamo* is a 1 *dynasty* 2 *crater* 3 *bomb* 4 *machine.*	☐	☐	☐	☐
40.	*Supreme* means 1 *plentiful* 2 *joyous* 3 *utmost* 4 *ordinary.*	☐	☐	☐	☐
41.	To *consecrate* is to 1 *depart* 2 *devote* 3 *slay* 4 *desire.*	☐	☐	☐	☐
42.	To *transmit* is to 1 *traverse* 2 *send* 3 *slash* 4 *reclaim.*	☐	☐	☐	☐

(GO ON TO NEXT PAGE)

		1	2	3	4
43.	*Corrupt* means 1 *impure* 2 *cordial* 3 *eminent* 4 *nervous.*	☐	☐	☐	☐
44.	A *forfeit* is a 1 *loss* 2 *forecast* 3 *dwarf* 4 *demand.*	☐	☐	☐	☐
45.	To *rend* is to 1 *cry* 2 *capture* 3 *tear* 4 *tuck.*	☐	☐	☐	☐
46.	To *solicit* is to 1 *sneak* 2 *impart* 3 *ask* 4 *inclose.*	☐	☐	☐	☐
47.	*Vigilant* means 1 *watchful* 2 *victorious* 3 *unworthy* 4 *valiant.*	☐	☐	☐	☐
48.	A *vogue* is a 1 *habit* 2 *drug* 3 *vacation* 4 *fashion.*	☐	☐	☐	☐
49.	*Attire* refers to 1 *dress* 2 *law* 3 *fame* 4 *buildings.*	☐	☐	☐	☐
50.	A *dialogue* is a 1 *debate* 2 *quarrel* 3 *conversation* 4 *drama.*	☐	☐	☐	☐
51.	*Penitent* means 1 *peerless* 2 *contrite* 3 *lamentable* 4 *patient.*	☐	☐	☐	☐
52.	*Verdant* means 1 *green* 2 *pure* 3 *realistic* 4 *vertical.*	☐	☐	☐	☐
53.	To *disparage* means to 1 *belittle* 2 *disrupt* 3 *engross* 4 *equalize*	☐	☐	☐	☐
54.	A *transgressor* is a 1 *surveyor* 2 *listener* 3 *straggler* 4 *sinner.*	☐	☐	☐	☐
55.	To *bequeath* is to 1 *beseech* 2 *assert* 3 *will* 4 *attach.*	☐	☐	☐	☐
56.	To *mitigate* is to 1 *duplicate* 2 *lessen* 3 *destroy* 4 *accuse.*	☐	☐	☐	☐
57.	*Nominal* means 1 *small* 2 *unknown* 3 *tall* 4 *dishonest.*	☐	☐	☐	☐
58.	*Chaos* means 1 *prudence* 2 *chastity* 3 *confusion* 4 *pursuit.*	☐	☐	☐	☐
59.	To *facilitate* is to 1 *expound* 2 *escort* 3 *falsify* 4 *assist.*	☐	☐	☐	☐
60.	A *token* is a kind of 1 *vice* 2 *sign* 3 *fable* 4 *helmet.*	☐	☐	☐	☐

No. Right..... *Score*.....

No. right	0–12	13	14	15	16	17	18	19	20	21	22
Score	40	42	44	46	48	50	52	54	56	58	60

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
62	63	65	66	68	69	70	72	73	74	75	76	77	78	80	81	83	83	84	85	86	86	87	88	89	89	90	91	92	93	93	94	95	96	97	97	98	99

TEST 6. READING: COMPREHENSION

DIRECTIONS: **This test consists of several stories or passages. Each story or passage is followed by a few statements. Read the story or passage first. Then in each statement find the answer that makes the statement true and place an X in the square at the right that is numbered the same as the answer you chose. You will save time if you can select the right answers after having read the story or passage once. But you may look at the story or passage again if you need to do so in selecting the right answers. Do not skip any of the items.**

EXAMPLE: Bob has a kitten, a puppy, and a rabbit. He feeds his kitten milk, his puppy meat scraps, and his rabbit carrots.

	ANSWERS		
	1	2	3
a. Bob has 1 one pet 2 two pets 3 three pets.	☐	☐	☒
b. He feeds meat scraps to his 1 kitten 2 puppy 3 rabbit.	☐	☒	☐

I

Caleb was half glad and half sorry that the long journey by covered wagon was ending without even a glimpse of an Indian. It seemed queer, as he and his sister Jane looked across the wide, flat prairie, to hear Father say, "Well, children, here is your new home," for no house was in sight.

Mother's first remark was, "Blossom should give us plenty of milk with so much good grass to eat."

Jane whispered to Caleb, "Do you think Cappy will be lonely with no other kitten to play with?"

	1	2	3
1. Caleb and his family traveled to their new home by 1 boat 2 train 3 wagon.	☐	☐	☐
2. Their house was 1 not begun 2 half built 3 ready to be lived in.	☐	☐	☐
3. They would live 1 near the ocean 2 on the prairie 3 in the hills.	☐	☐	☐
4. The cow was named 1 Blossom 2 Daisy 3 Cappy.	☐	☐	☐

II

Fred Wilson is older than his brother Roy. Fred is three grades above Roy, who is in the second grade. When the boys start to school each morning, Fred's dog Spot goes with them as far as the bus stop.

	1	2	3
5. Spot belongs to 1 Mr. Wilson 2 Roy 3 Fred.	☐	☐	☐
6. Fred is in the 1 fifth grade 2 third grade 3 first grade.	☐	☐	☐
7. Each morning Spot goes to 1 school 2 the bus stop 3 the store.	☐	☐	☐

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III

Mother Opossum lives in a hollow tree. She has a round body, small ears, and a pointed nose. Her long, strong tail is used for climbing and for holding her babies on her back. She travels but little in daytime. When she is caught she plays dead.

	1	2	3
8. Mother Opossum's nose is 1 round 2 small 3 pointed.	☐	☐	☐
9. She makes her home in 1 caves 2 hollow trees 3 logs.	☐	☐	☐
10. She travels 1 at night 2 in daytime 3 constantly.	☐	☐	☐
11. Her little opossums ride on her 1 head 2 back 3 tail.	☐	☐	☐

IV

I cannot vouch for the truth of the following story about an old couple who lived in an out-of-the-way hill country. It was told to me by a village doctor.

Grandpa Timothy Cotton and his good wife Virginia were in the habit of going to bed quite early in the evening—about eight o'clock—and arising quite early in the morning at the sound of the alarm clock which remained set day after day for five o'clock. One Saturday evening after a tiring day of work they agreed to go to bed an hour earlier than usual and sleep later the following morning.

"Ginny," said Tim as he made preparation for his comfortable bed, "set the alarm for eight o'clock in the morning. I want to get a good rest tonight."

"All right, Tim," replied Virginia; "it won't hurt the stock to be fed late in the morning." So the alarm clock was set and the kindly old couple were soon fast asleep.

When the alarm finally awakened them from their deep slumber, Virginia began preparation for breakfast as Timothy dressed to feed the stock. As he stumbled along toward the barn he muttered to himself, "I can't imagine why it's so dark this late in the morning."

	1	2	3
12. The couple in this story were 1 young 2 middle-aged 3 old.	☐	☐	☐
13. The usual bedtime of the couple was 1 eight o'clock 2 seven o'clock 3 five o'clock.	☐	☐	☐
14. The couple had slept 1 13 hours 2 10 hours 3 1 hour.	☐	☐	☐
15. In addressing her husband, Virginia called him 1 Timothy 2 Tim 3 Mr. Cotton.	☐	☐	☐
16. The story was told by 1 a doctor 2 Timothy 3 Virginia.	☐	☐	☐
17. On this Saturday evening the couple retired at 1 five o'clock 2 seven o'clock 3 eight o'clock.	☐	☐	☐

(GO ON TO NEXT PAGE)

V

Ulysses and his men were shipwrecked on the island of Polyphemus, a cruel one-eyed giant, who imprisoned his captives in a cave where he kept his sheep at night. The prisoners escaped because their leader was a very crafty man. He put out the giant's eye with a heated rod. The sailors went unseen from the cave in the morning when Polyphemus turned his sheep out to graze.

	1	2	3
18. Ulysses was 1 one-eyed 2 cruel 3 crafty.	☐	☐	☐
19. Polyphemus was 1 captured 2 blinded 3 shipwrecked.	☐	☐	☐
20. The sailors were imprisoned in a 1 cave 2 tower 3 ship.	☐	☐	☐
21. The giant was a 1 sailor 2 shepherd 3 wrestler.	☐	☐	☐

VI

"The world is too much with us; late and soon,
Getting and spending we lay waste our powers;
Little we see in Nature that is ours;
We have given our hearts away, a sordid boon."

	1	2	3
22. We are too much concerned with 1 money 2 power 3 Nature.	☐	☐	☐
23. We fail to appreciate 1 the world 2 Nature 3 our hearts.	☐	☐	☐
24. We dissipate our 1 money 2 health 3 potentialities.	☐	☐	☐

VII

Many years ago large numbers of our American people lived in rural areas. In those days families produced their food and apparel on their farms. The shift of population to cities was a result of industrial developments and transportation which, in turn, were made possible by numerous basic inventions during the early nineteenth century. These developments have enabled a smaller proportion of the population to provide farm products for the whole nation.

	1	2	3
25. The industrial revolution caused 1 urban growth 2 inventions 3 rural growth.	☐	☐	☐
26. The period of basic inventions was about 1 1701 to 1740 2 1801 to 1840 3 1901 to 1940.	☐	☐	☐
27. The farmer of the present time as compared with the farmer of the early days is able to produce 1 more 2 less 3 the same amount.	☐	☐	☐

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VIII

If a coin is tossed one hundred times the number of heads that fall plus the number of tails will, of course, total one hundred. However, there are many possible combinations of heads and tails; such, for example, as forty heads and sixty tails, fifty-five heads and forty-five tails, and so on to one hundred heads and no tails. The number of possible combinations is always one more than the number of tosses. The most likely of the various possible heads-tails combinations is heads fifty times and tails fifty times. Nevertheless, each separate toss of the coin is an independent event which is not influenced by the results of previous tosses.

28. If a coin is tossed one hundred times, the greatest number of times it can fall tails is 1 45 2 60 3 100. ..... 1 ☐ 2 ☐ 3 ☐

29. If a coin has fallen heads ten times from ten successive tosses, on the next toss
1 tail is more likely than head
2 head is more likely than tail
3 head or tail is equally likely. ..... 1 ☐ 2 ☐ 3 ☐

30. In a series of one hundred tosses of a coin, the number of possible heads-tails combinations is 1 99 2 100 3 101. ..... 1 ☐ 2 ☐ 3 ☐

31. If thirty heads fall in one hundred tosses, the number of tails will be 1 30 2 70 3 71. ..... 1 ☐ 2 ☐ 3 ☐

IX

The Supreme Court of the United States serves as an umpire between the federal government and the state governments. It also decides whether laws passed by the Congress are in conflict with the Constitution of the United States. In considering a law the Supreme Court disregards the motives the Congress may have had in passing the legislation. Also, personal feelings and interests of the members of this high tribunal are eliminated in all of its decisions.

32. The Supreme Court decides whether laws are 1 fair 2 constitutional 3 too strict. ..... 1 ☐ 2 ☐ 3 ☐

33. The Supreme Court considers a law on the basis of 1 its wording 2 its intentions 3 the President's wishes. ..... 1 ☐ 2 ☐ 3 ☐

34. The attitude of the Supreme Court is 1 noncommittal 2 subjective 3 objective. ..... 1 ☐ 2 ☐ 3 ☐

35. In a litigation between a state and the federal government the Supreme Court would serve as 1 prosecutor 2 referee 3 defendant. ..... 1 ☐ 2 ☐ 3 ☐

36. The Supreme Court settles disputes between states and 1 individuals 2 cities 3 the national government. ..... 1 ☐ 2 ☐ 3 ☐

No. Right..... *Score*.....

No. right	0-9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Score	40	42	45	48	50	53	55	58	60	63	65	67	69	71	73	78	83	86	88	91	92	93	94	95	96	97	98	99

TEST 7. SOCIAL STUDIES

DIRECTIONS: Find the answer that you believe makes the statement true and then place an X in the square at the right that is numbered the same as the answer you choose. Do not skip any of the items.

EXAMPLE: The capital of the United States is
1 Denver 2 Washington 3 Chicago 4 Atlanta. .....

ANSWERS			
1	2	3	4
☐	☒	☐	☐

		ANSWERS			
		1	2	3	4
1.	A waterway made by man is a 1 strait 2 bay 3 sound 4 canal.	☐	☐	☐	☐
2.	La Salle explored 1 the Mississippi River 2 Cuba 3 Florida 4 Peru.	☐	☐	☐	☐
3.	Dikes are 1 lace-making machines 2 sea walls 3 fishing boats 4 lands of nobles.	☐	☐	☐	☐
4.	During World War II, the head of the government of the Soviet Union was 1 Leon Trotsky 2 Count Leo Tolstoy 3 Nikolay Lenin 4 Joseph Stalin.	☐	☐	☐	☐
5.	David Crockett was 1 an English knight 2 a singer 3 an American frontiersman 4 an inventor.	☐	☐	☐	☐
6.	Boulder Dam controls the wild current of the 1 Colorado River 2 Brazos River 3 Tennessee River 4 Arkansas River.	☐	☐	☐	☐
7.	In traveling from Delaware to Kansas, a person would go 1 north 2 east 3 south 4 west.	☐	☐	☐	☐
8.	An important product of Central America is 1 asbestos 2 ivory 3 bananas 4 grain.	☐	☐	☐	☐
9.	George Washington's burial place is 1 Westminster Abbey 2 Arlington Cemetery 3 Richmond 4 Mount Vernon.	☐	☐	☐	☐
10.	The most important means of transporting goods in the United States is by 1 railroads 2 airplanes 3 river boats 4 trucks.	☐	☐	☐	☐
11.	The monasteries of the Middle Ages served as 1 hospitals and libraries 2 military strongholds 3 taverns 4 storehouses for weapons.	☐	☐	☐	☐
12.	Long Island is a part of the state of 1 Rhode Island 2 Michigan 3 Delaware 4 New York.	☐	☐	☐	☐
13.	A forage crop is 1 tomatoes 2 squash 3 alfalfa 4 peppers.	☐	☐	☐	☐
14.	In the territory owned by the United States, the point closest to Russia is in 1 Florida 2 Oregon 3 Alaska 4 California.	☐	☐	☐	☐
15.	Excellent roads were built by the 1 Romans 2 Greeks 3 Egyptians 4 Arabs.	☐	☐	☐	☐
16.	The swampy region in Florida is known as the 1 Piedmont 2 Bayou 3 Klondike 4 Everglades.	☐	☐	☐	☐
17.	The first settlement by Europeans on the North American continent was made by the 1 French 2 Dutch 3 English 4 Spanish.	☐	☐	☐	☐

(GO ON TO NEXT PAGE)

18. The capital of Cuba is 1 Havana 2 Manila 3 Honolulu 4 San Juan. ..... 1 2 3 4 ☐ ☐ ☐ ☐

19. Tigris and Euphrates are 1 cities 2 tribes 3 rivers 4 gods. ..... 1 2 3 4 ☐ ☐ ☐ ☐

20. The peons of Mexico are the
1 wealthy landowners 2 priests 3 cowboys 4 poor farm laborers. ..... 1 2 3 4 ☐ ☐ ☐ ☐

21. The Imperial Valley is a rich farming section in
1 Iowa 2 Missouri 3 Georgia 4 California. ..... 1 2 3 4 ☐ ☐ ☐ ☐

22. The great Negro section of New York City is
1 the Bronx 2 Brooklyn 3 Harlem 4 Richmond. ..... 1 2 3 4 ☐ ☐ ☐ ☐

23. To the Phoenicians we owe our
1 compass 2 art of weaving 3 alphabet 4 telescope. ..... 1 2 3 4 ☐ ☐ ☐ ☐

24. Before money came into use, the method of exchange was called
1 homage 2 tally 3 fealty 4 barter. ..... 1 2 3 4 ☐ ☐ ☐ ☐

25. Most of the records of the earliest peoples are found
1 on the skins of animals 2 on paper scrolls
3 on the bark of trees 4 on tablets of clay and stone. ..... 1 2 3 4 ☐ ☐ ☐ ☐

26. Turpentine is derived from 1 coal 2 crude oil 3 camphor trees 4 pine trees. 1 2 3 4 ☐ ☐ ☐ ☐

27. The European country which has remained neutral through many periods of war is 1 Germany 2 Poland 3 France 4 Switzerland. ..... 1 2 3 4 ☐ ☐ ☐ ☐

28. The number of standard time zones in the United States is
1 two 2 four 3 six 4 eight. ..... 1 2 3 4 ☐ ☐ ☐ ☐

29. Sisal is a plant fiber used for making 1 medicine 2 flavoring 3 rope 4 paper. 1 2 3 4 ☐ ☐ ☐ ☐

30. It was during the Hundred Years' War that the French army was led by
1 Charlemagne 2 Joan of Arc 3 Napoleon 4 Hugh Capet. ..... 1 2 3 4 ☐ ☐ ☐ ☐

31. The Tudors and the Stuarts were ruling families of
1 England 2 France 3 Spain 4 Italy. ..... 1 2 3 4 ☐ ☐ ☐ ☐

32. A wise use of natural resources is called
1 conservation 2 erosion 3 proration 4 rationing. ..... 1 2 3 4 ☐ ☐ ☐ ☐

33. Helsinki is the capital of 1 Poland 2 Czechoslovakia 3 Finland 4 Turkey. 1 2 3 4 ☐ ☐ ☐ ☐

34. A good place for grazing reindeer is
1 a fiord 2 a tundra 3 an estuary 4 a savannah. ..... 1 2 3 4 ☐ ☐ ☐ ☐

35. An excellent harbor is found in 1 Winnipeg 2 Halifax 3 Edmonton 4 Regina. 1 2 3 4 ☐ ☐ ☐ ☐

36. The "George Washington of South America" was
1 Samuel de Champlain 2 Francisco Coronado
3 Simon Bolivar 4 Hernando Cortez. ..... 1 2 3 4 ☐ ☐ ☐ ☐

37. *Anthracite* and *bituminous* are the names of two kinds of
1 stone 2 coal 3 wheat 4 tobacco. ..... 1 2 3 4 ☐ ☐ ☐ ☐

(GO ON TO NEXT PAGE)

38. Prince Henry the Navigator was
1 a Portuguese 2 an Austrian 3 a Venetian 4 a Moor. ..... 1 2 3 4 ☐ ☐ ☐ ☐

39. The power of Napoleon ended at the battle of
1 Crécy 2 Flodden Field 3 Agincourt 4 Waterloo. ..... 1 2 3 4 ☐ ☐ ☐ ☐

40. The settler who discovered that tobacco would grow well in Virginia was
1 John Rolfe 2 Captain John Smith 3 Captain Newport 4 Sir Walter Raleigh. 1 2 3 4 ☐ ☐ ☐ ☐

41. The Hohenzollerns were the royal family of
1 Sweden 2 Russia 3 Prussia 4 Scotland. ..... 1 2 3 4 ☐ ☐ ☐ ☐

42. The distance across the United States, from coast to coast, is about
1 1,000 miles 2 2,000 miles 3 3,000 miles 4 10,000 miles. ..... 1 2 3 4 ☐ ☐ ☐ ☐

43. An important crop in all of the Mediterranean countries is
1 hemp 2 olives 3 dates 4 cotton. ..... 1 2 3 4 ☐ ☐ ☐ ☐

44. Two cities of India are
1 Warsaw and Budapest 2 Sofia and Krakow
3 Calcutta and Delhi 4 Batum and Omsk. ..... 1 2 3 4 ☐ ☐ ☐ ☐

45. The civilization of Greece was older than that of
1 China 2 Rome 3 Egypt 4 India. ..... 1 2 3 4 ☐ ☐ ☐ ☐

46. The figures which we use in arithmetic we owe to the
1 Chinese 2 Phoenicians 3 Aztecs 4 Arabs. ..... 1 2 3 4 ☐ ☐ ☐ ☐

47. The river that is most important in the lives of the Russian people is the
1 Dnieper 2 Don 3 Lena 4 Volga. ..... 1 2 3 4 ☐ ☐ ☐ ☐

48. Phoenicia was on the
1 Red Sea 2 Black Sea 3 Persian Gulf 4 Mediterranean Sea. ..... 1 2 3 4 ☐ ☐ ☐ ☐

49. The common people of Rome were called
1 patricians 2 plebeians 3 tribunes 4 consuls. ..... 1 2 3 4 ☐ ☐ ☐ ☐

50. The Piedmont Belt includes parts of
1 Ohio 2 Montana 3 Texas 4 the Carolinas. ..... 1 2 3 4 ☐ ☐ ☐ ☐

51. Two rivers of Europe about which well-known music has been written are the
1 Danube and Volga 2 Dniester and Dnieper
3 Niger and Nile 4 Weser and Tiber. ..... 1 2 3 4 ☐ ☐ ☐ ☐

52. The Alhambra was
1 a beautiful Moorish palace 2 the lawmaking body of Athens
3 the temple of Diana 4 a Roman aqueduct. ..... 1 2 3 4 ☐ ☐ ☐ ☐

53. "Thar she blows" was a welcome statement to men who were
1 getting water from windmills 2 blasting tree stumps
3 fishing for whales 4 exploring volcanoes. ..... 1 2 3 4 ☐ ☐ ☐ ☐

54. Newcastle produces 1 tin 2 coal 3 wine 4 coffee. ..... 1 2 3 4 ☐ ☐ ☐ ☐

(GO ON TO NEXT PAGE)

55. The associations of merchants and craftsmen in the Middle Ages were known as 1 unions 2 guilds 3 boroughs 4 manors. ..... 1 2 3 4 ☐ ☐ ☐ ☐

56. The Union Jack is another name for
1 the British flag 2 England's colonial empire
3 the Parliament buildings 4 the Great Seal of England. ..... 1 2 3 4 ☐ ☐ ☐ ☐

57. The Renaissance was the revival or rebirth of
1 Greek and Roman learning 2 the pagan religions
3 feudalism 4 the Crusades. ..... 1 2 3 4 ☐ ☐ ☐ ☐

58. Egypt's seaport is 1 Cairo 2 Memphis 3 Alexandria 4 Thebes. ..... 1 2 3 4 ☐ ☐ ☐ ☐

59. The Middle Ages were the years between
1 732 and 1066 2 476 and 1492 3 1350 and 1600 4 1400 and 1890. ..... 1 2 3 4 ☐ ☐ ☐ ☐

60. Most of our cranberries come from
1 New England 2 the prairie states
3 the Great Lakes Region 4 the Kentucky mountains. ..... 1 2 3 4 ☐ ☐ ☐ ☐

61. The capital of Denmark is
1 Copenhagen 2 Antwerp 3 Amsterdam 4 Stockholm. ..... 1 2 3 4 ☐ ☐ ☐ ☐

62. The Rocky Mountains are a part of the chain known as the
1 Cordilleras 2 Appalachians 3 Sierra Nevadas 4 Adirondacks. ..... 1 2 3 4 ☐ ☐ ☐ ☐

63. The Protestants in France were called
1 Calvinists 2 Roundheads 3 Huguenots 4 Puritans. ..... 1 2 3 4 ☐ ☐ ☐ ☐

64. The first state to ratify the Constitution of the United States was
1 New York 2 Virginia 3 Delaware 4 Massachusetts. ..... 1 2 3 4 ☐ ☐ ☐ ☐

65. The system of land ownership in the Middle Ages is known as
1 feudalism 2 chivalry 3 commonwealth 4 vandalism. ..... 1 2 3 4 ☐ ☐ ☐ ☐

66. Helium is a gas used
1 as an anesthetic 2 in dirigibles 3 as a fuel 4 in submarines. ..... 1 2 3 4 ☐ ☐ ☐ ☐

No. Right..... *Score*.....

No. right	0–13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Score	39	42	48	53	57	60	63	65	66	67	69	70	71	72	74	75

29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
76	78	79	80	80	81	82	83	83	84	84	85	86	86	87	88	88	89	89	90	90	91	91	92	92	93	93	94	94	95	95	96	96	97	97	98	99	99

TEST 8. HEALTH AND SAFETY

DIRECTIONS: **Find the answer that you believe makes the statement true and then place an X in the square at the right that is numbered the same as the answer you choose. Do not skip any of the items.**

EXAMPLE: A drink that builds body tissue is
1 coffee 2 tea 3 milk 4 ginger ale. .....

ANSWERS			
1	2	3	4
☐	☐	☒	☐

1. The best way to keep food from spoiling is to keep it 1 covered 2 warm 3 dry 4 cold.	1 ☐	2 ☐	3 ☐	4 ☐
2. A safe place to play is a 1 fenced yard 2 sandbank 3 gravel pit 4 haymow.	1 ☐	2 ☐	3 ☐	4 ☐
3. The skull protects the 1 heart 2 brain 3 scalp 4 throat.	1 ☐	2 ☐	3 ☐	4 ☐
4. Houses have screens to keep out 1 dust 2 germs 3 heat 4 insects.	1 ☐	2 ☐	3 ☐	4 ☐
5. The Eskimos' diet contains much 1 sugar 2 starch 3 fat 4 minerals.	1 ☐	2 ☐	3 ☐	4 ☐
6. A person should never touch an electric light switch if he is 1 wearing wool clothing 2 chewing gum 3 standing on a rubber mat 4 standing in water.	1 ☐	2 ☐	3 ☐	4 ☐
7. Milk is safer to drink after it has been 1 evaporated 2 homogenized 3 diluted 4 pasteurized.	1 ☐	2 ☐	3 ☐	4 ☐
8. The most healthful cereals are 1 toasted 2 white 3 made from corn 4 whole-grain.	1 ☐	2 ☐	3 ☐	4 ☐
9. It is dangerous to start a fire with 1 newspapers 2 pine kindling 3 leaves and brush 4 kerosene.	1 ☐	2 ☐	3 ☐	4 ☐
10. It is dangerous to clean clothes at home with 1 sponges 2 absorbing blotters 3 water and soap 4 gasoline.	1 ☐	2 ☐	3 ☐	4 ☐
11. An object which is sterile is free from 1 color 2 odor 3 germs 4 moisture.	1 ☐	2 ☐	3 ☐	4 ☐
12. A dog pants because he cannot 1 cough 2 bark 3 sweat 4 eat.	1 ☐	2 ☐	3 ☐	4 ☐
13. The human body is composed of great numbers of tiny 1 bones 2 cells 3 germs 4 pores.	1 ☐	2 ☐	3 ☐	4 ☐
14. The mucous membranes of a healthy human body are always 1 dry 2 cool 3 moist 4 rough.	1 ☐	2 ☐	3 ☐	4 ☐
15. Mouth-breathing is often caused by 1 impure air 2 enlarged adenoids 3 poor circulation 4 decayed teeth.	1 ☐	2 ☐	3 ☐	4 ☐
16. An amber-colored traffic light means 1 the light is changing from green to red 2 a very busy crossing 3 only pedestrians may cross 4 all cars must stop for fire trucks.	1 ☐	2 ☐	3 ☐	4 ☐

(GO ON TO NEXT PAGE)

17. The name of a gland in the human body is
1 retina 2 biceps 3 pelvis 4 thyroid. ..... 1 2 3 4 ☐ ☐ ☐ ☐

18. The tuberculin test is given to 1 dogs 2 horses 3 sheep 4 cows. ..... 1 2 3 4 ☐ ☐ ☐ ☐

19. Disease is spread mainly by 1 the wind 2 personal contact 3 steam 4 food. 1 2 3 4 ☐ ☐ ☐ ☐

20. The elbow is an example of the
1 hinge joint 2 pivot joint 3 ball and socket joint 4 double joint. ..... 1 2 3 4 ☐ ☐ ☐ ☐

21. A child who has rickets has had
1 too little rest 2 too little exercise 3 improper food 4 impure water. ..... 1 2 3 4 ☐ ☐ ☐ ☐

22. Changing food so that the body can use it is called
1 dieting 2 nutrition 3 digestion 4 sanitation. ..... 1 2 3 4 ☐ ☐ ☐ ☐

23. A sign that the body is fighting an infection is the presence of
1 blisters 2 pus 3 skin rash 4 bleeding. ..... 1 2 3 4 ☐ ☐ ☐ ☐

24. The palate aids in 1 walking 2 seeing 3 chewing 4 speaking. ..... 1 2 3 4 ☐ ☐ ☐ ☐

25. The eyes at work are most like a 1 mirror 2 radio 3 pump 4 camera. ..... 1 2 3 4 ☐ ☐ ☐ ☐

26. A tourniquet is used to
1 set a broken bone
2 stop bleeding
3 rescue a drowning person
4 treat a burn. ..... 1 2 3 4 ☐ ☐ ☐ ☐

27. An important nerve center is the 1 lungs 2 heart 3 spinal cord 4 liver. 1 2 3 4 ☐ ☐ ☐ ☐

28. A disinfectant is useful in
1 cleaning garbage cans 2 brushing teeth 3 washing hair 4 preparing meals. 1 2 3 4 ☐ ☐ ☐ ☐

29. A school that has good sanitation has
1 clean toilets
2 a good heating system
3 well-trained teachers
4 a school nurse. ..... 1 2 3 4 ☐ ☐ ☐ ☐

30. Fatigue is the same as 1 sickness 2 nervousness 3 tiredness 4 sleepiness. 1 2 3 4 ☐ ☐ ☐ ☐

31. The epiglottis is most like a 1 pipe 2 trapdoor 3 filter 4 magnet. ..... 1 2 3 4 ☐ ☐ ☐ ☐

32. The coloring materials in the eye are in the 1 pupil 2 iris 3 cornea 4 lens. 1 2 3 4 ☐ ☐ ☐ ☐

33. A diseased optic nerve would affect a person's
1 sight 2 digestion 3 heartbeat 4 weight. ..... 1 2 3 4 ☐ ☐ ☐ ☐

34. To prevent fainting, one should
1 drink water 2 walk fast 3 lower his head 4 eat salt. ..... 1 2 3 4 ☐ ☐ ☐ ☐

35. The biceps and the triceps are
1 blood vessels 2 muscles 3 glands 4 nerve centers. ..... 1 2 3 4 ☐ ☐ ☐ ☐

(GO ON TO NEXT PAGE)

		1	2	3	4
36.	Swelling of the salivary glands is a symptom of 1 food poisoning 2 mumps 3 anemia 4 indigestion.	☐	☐	☐	☐
37.	The name of one very harmful kind of germ is 1 streptococcus 2 ventricle 3 niacin 4 merthiolate.	☐	☐	☐	☐
38.	The heat of the body is regulated mostly by the 1 breathing 2 digestion 3 skin 4 glands.	☐	☐	☐	☐
39.	Practically all body processes are dependent on 1 water 2 heat 3 calcium 4 plasma.	☐	☐	☐	☐
40.	The treatment of cancer often involves the use of 1 radium 2 insulin 3 oxygen 4 penicillin.	☐	☐	☐	☐
41.	The mastoid bone is a part of the 1 skull 2 hand 3 shoulder 4 pelvis.	☐	☐	☐	☐
42.	To humidify air is to 1 purify it 2 dry it 3 add moisture to it 4 add oxygen to it.	☐	☐	☐	☐
43.	A highly contagious skin disease is 1 hives 2 impetigo 3 nettle rash 4 eczema.	☐	☐	☐	☐
44.	Where a railroad and a highway cross, the best safety device is 1 a red light 2 a signal bell 3 a Stop-Look-Listen sign 4 an underpass or overpass.	☐	☐	☐	☐
45.	An example of internal senses is 1 hunger 2 sight 3 touch 4 temperature.	☐	☐	☐	☐
46.	Dehydrated foods are produced by the removal of most of their 1 vitamins 2 flavor 3 water 4 food value.	☐	☐	☐	☐
47.	The vertebrae are 1 bones 2 blood vessels 3 muscles 4 air passages.	☐	☐	☐	☐
48.	In the human body the organ of balance is in the 1 spine 2 brain 3 thyroid gland 4 inner ear.	☐	☐	☐	☐
49.	The windpipe is kept open by 1 rings of cartilage 2 the passage of air 3 throat muscles 4 small bones.	☐	☐	☐	☐
50.	Diseases of the eye should be treated by an 1 osteopath 2 optometrist 3 oculist 4 optician.	☐	☐	☐	☐

No. Right..... *Score*.....

No. right	0-9	10	11	12
Score	40	43	47	49

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
52	55	57	59	61	63	65	66	68	69	71	72	74	75	76	78	79	80	82	83	84	85	85	86	87	88	89	90	91	92	93	94	95	95	96	97	98	99

TEST 9. ARITHMETIC REASONING

DIRECTIONS: Find the answers as quickly as possible. Be sure to write each answer in the space provided for it at the right-hand margin of the page.

ANSWERS

1. Ralph has $79 and his sister has $43. Ralph has how much more than his sister? — 1 $.....
2. John had $124 in the bank. He then sold his fat pig for $43 and earned $26 helping his father. When all of this was put in the bank, how much did John have in the bank? — 2 $.....
3. If the first Sunday of a month is on the 5th, the third Sunday will be on what day of the month? — 3 .....
4. Mr. Brown asked for 78¢ worth of stamps at the post office window and laid down a dollar bill in payment. How much more will he need to add to the dollar in order to receive a quarter in change? — 4 .....cts.
5. Joe's teacher is 10 years older than twice Joe's age. Joe is 6 years old. How old is his teacher? — 5 .....
6. James earns $24 each week and spends $16 of his earnings each week. How much will he have saved in six weeks? — 6 $.....
7. Dorothy is 8 years old and Julia is 10. What will the sum of their age be four years from now? — 7 ..... yrs.
8. If Harry eats an egg each morning for breakfast, how many days will four dozen eggs last him? — 8 .....
9. A wire 112 feet long was doubled to make a two-strand clothes line. The posts for the clothes line must be placed how many feet apart? — 9 .....ft.
10. The World Calendar has 312 working days each year. How many working days does it have each quarter year? — 10 .....
11. Mr. Green bought a 5-gallon can of paint for his garage. It took only $3\frac{1}{3}$ gallons. How many gallons did he have left? — 11 .....gal.
12. A history teacher assigned the first half of chapter 6. The chapter begins on page 196 and ends on page 228. To what page must the class read? — 12 p. .....
13. Each of 16 girls paid 75¢ into a club fund. The expenses of the club were $2.25, $1.50, $3.00, and $3.50. How much remained in the club fund? — 13 $.....
14. In a certain period of time, one pig will eat $2\frac{2}{3}$ bushels of corn. In the same time how many bushels will 9 pigs eat? — 14 ..... bu.
15. The daily temperature readings at 8 o'clock each morning for a week were 63, 58, 54, 51, 55, 57, 61. What was the average temperature for the week? — 15 ..... degrees
16. Mr. Carter had $2\frac{1}{2}$ acres of land which he marked off into lots of $\frac{5}{8}$ acres each. How many lots did he have? — 16 .....
17. A plane with an air speed of 160 miles per hour is traveling head-on into a wind of 30 miles per hour. How far will the plane have traveled in one and one-half hours? — 17 ..... mi.
18. Harry gave $\frac{1}{3}$ of his apple to one friend and $\frac{1}{4}$ of it to another friend. What part of the apple did he give away? — 18 .....

(GO ON TO NEXT PAGE)

19. Some clocks and watches are now made with 24 hours marked on the dial instead of 12. (Each new day starts at midnight.) When an ordinary clock reads 5:35 p. m., what does this new clock read? 19 .....

20. Builders think of distance below the surface of the ground as minus and elevation above the surface as plus. What is the total height of a building with a foundation at −12 ft. and a roof elevation at 80 ft.? 20 .....ft.

21. How many blocks, each a one-inch cube, must be stacked together to make a three-inch cube? 21 .....

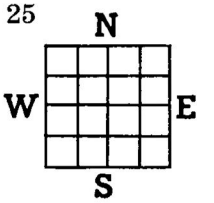
22. What is the next fraction in this series of fractions? $\frac{1}{3}$, $\frac{1}{6}$, $\frac{1}{12}$ 22 .....

23. A shoe store sold 80 pairs of ladies' shoes in one day which was .4 of the total number of pairs sold. How many pairs of shoes did the store sell on that day? 23 .....

24. Arthur's father was 35 years old when Arthur was born. Arthur's present age of 15 years is what part of his father's age? (Write the answer in the form of a decimal fraction.) 24 .....

A section of land contains 640 acres.

25. In the section shown at the right, blacken the space described as follows: The NE quarter of the SW quarter. 25



26. How many acres are in the space described above? 26 .....

27. Mr. Evans' home has an assessed value of $9000. The school tax rate is $1.50 per $100 assessed value. How much school tax does Mr. Evans pay? 27 $.....

28. If fire insurance costs 16 cents per $100 of insurance, what will it cost to insure a house for $5000? 28 $.....

29. A fence post which is 9 feet high casts a shadow 3 feet long. How high is a telephone pole which casts a shadow 11 feet long at the same time of day? 29 .....ft.

30. A girl can type $\frac{2}{3}$ of a page in 12 minutes. How many pages can she type in $1\frac{1}{2}$ hours? 30 .....

31. A wall which is 15 feet by 10 feet has a window 6 feet by 5 feet. How many square feet of paper will be required to cover the wall? 31 .....sq. ft.

32. What is the area of a triangle which has a base of 12 inches and an altitude of 8 inches? $\left(A = \frac{a \times b}{2}\right)$ 32 .....sq. in.

33. How many feet of border tape will be required for a sofa pillow which is 18 inches square? 33 .....ft.

34. If a sphere with a diameter of 2 inches is placed inside a 2-inch cubical box, 3.81 cubic inches of water can be poured into the box. If the 2-inch sphere is removed and eight 1-inch spheres are placed inside the box, will it now hold more water than before, the same amount, or less? (Answer *more*, *same*, or *less*.) 34 .....

35. A certain tile pattern is made up of squares each of which is a white four-inch square with a black center square having an area of four square inches. How many square inches of white surround each small black square? 35 .....sq. in.

(GO ON TO NEXT PAGE)

36. Here are the arithmetic scores made by a group of children:

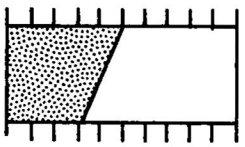
Mary 17	Jane 15	Maude 16
Bob 20	Bess 22	Carl 10
Joe 13	Roy 12	Ben 17
Ruth 11		

What per cent of the group made lower scores than Jane? 36 .....%

37. What is the length of one side of a square the area of which is 400 square feet? 37 .....ft.

38. Mr. Crane bought furniture priced at $350. The price was reduced 6 per cent for cash. How much did Mr. Crane save by paying cash? 38 $.....

39. How much interest will be paid on a six-months loan of $1200 at the rate of 6 per cent per annum? 39 $.....



40. What per cent of this rectangle is shaded? 40 .....%

41. Mr. Holt has a National Service Life Insurance policy for $10,000 on which he pays a premium of $42.20 each quarter-year. At this rate what is the annual premium per $1000 of insurance? 41 $.....

42. A car which travels r miles per hour will go how far in 8 hours? 42 .....mi.

43. Ten thousand husbands on their 35th birthday wish to guarantee the payment of $1000 to each of their wives who becomes a widow within the next twelve months.
Life tables show that 9954 of the husbands may be expected to be living on their 36th birthday.
How much should each of the 10,000 men pay into the fund? 43 $.....

44. Mr. Stone has 60 acres of land in pasture. This is 37½ per cent of his farm. How many acres are in the farm? 44 ..... a.

45. What is the ratio of 14 to 23 rounded off to two decimal places? 45 .....

46. Mr. Marr receives dividends amounting to $120 per year on his bonds which pay 2½ per cent dividends. What is the face value of the bonds? 46 $.....

No. Right..... *Score*.....

No. right	0	1	2	3	4	5	6	7	8
Score	40	43	45	47	50	52	55	58	60

9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
65	67	70	73	75	76	78	81	83	84	85	86	87	88	88	89	90	90	91	91	92	93	93	94	94	95	95	95	96	96	97	97	97	98	98	98	99	99

TEST 10. ARITHMETIC COMPUTATION

DIRECTIONS: Find the answers as quickly as possible but try to be accurate. Be sure to write each answer in the space provided for it at the right-hand margin of the page. Before beginning work on a problem be sure you understand what you are to do.

ANSWERS

(1) Subtract

$$\begin{array}{r} 17 \\ 5 \\ \hline \end{array}$$

1 .....

(2) Add

$$\begin{array}{r} 76 \\ 28 \\ \hline \end{array}$$

2 .....

(3) Subtract

$$\begin{array}{r} 34 \\ 7 \\ \hline \end{array}$$

3 .....

(4) $21 \div 3 =$

4 .....

(5) Subtract

$$\begin{array}{r} 7042 \\ 4685 \\ \hline \end{array}$$

5 .....

(6) Multiply

$$\begin{array}{r} 475 \\ 300 \\ \hline \end{array}$$

6 .....

(7) Add

$$\begin{array}{r} 465.83 \\ 92.66 \\ 634.95 \\ \hline \end{array}$$

7 .....

(8) Multiply

$$\begin{array}{r} \$9.16 \\ 54 \\ \hline \end{array}$$

8 .....

(9) $7\overline{)4203}$

9 .....

(10) Multiply

$$\begin{array}{r} 532 \\ 407 \\ \hline \end{array}$$

10 .....

(11) Multiply

$$\begin{array}{r} 672 \\ .16\frac{2}{3} \\ \hline \end{array}$$

11 .....

(12) Multiply

$$\begin{array}{r} 31.2 \\ 4.03 \\ \hline \end{array}$$

12 .....

(13) $26\overline{)53409}$

13 .....

(14) $\frac{1}{4} \times \frac{3}{5} =$

14 .....

(15) Add

$$\begin{array}{r} 6\frac{1}{4} \\ 4\frac{3}{8} \\ \hline \end{array}$$

15 .....

(16) How many sixths does this fraction equal? $\frac{2}{3} =$

16 .....

(17) How many eighths does this fraction equal? $\frac{9}{24} =$

17 .....

(18) Add

$$\begin{array}{r} 14\frac{4}{5} \\ 8\frac{2}{3} \\ \hline \end{array}$$

18 .....

(19) Multiply

$$\begin{array}{r} .56 \\ .008 \\ \hline \end{array}$$

19 .....

(20) Add

$$\begin{array}{r} 2 \text{ gal. } 3 \text{ qts. } 1 \text{ pt.} \\ 4 \text{ gal. } 2 \text{ qts. } 1 \text{ pt.} \\ \hline \end{array}$$

20 ....gal. ....qts.

(GO ON TO NEXT PAGE)

(21) Subtract

$30\frac{1}{6}$
$4\frac{3}{4}$

(22) $2\frac{3}{4} \div 1\frac{1}{2} =$

(23) Subtract

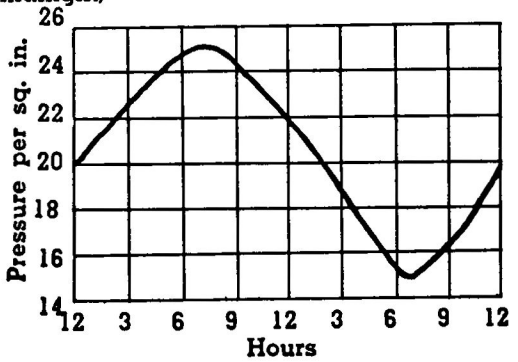
10
$5\frac{4}{7}$

21 .....

22 .....

23 .....

Water Pressure Record for Twenty-four Hours on a Summer Day in a Small City (midnight to midnight)



(24) What was the highest pressure reached for the period of record?

24 .....lb.

(25) At what hour was the water pressure lowest?

25 ..... p.m.

(26) $.06 \overline{)\ 34.0584}$ = 56764

Place the decimal point in its proper position in the answer.

26 5 6 7 6 4

(27) Add

$7\frac{2}{9}$
$4\frac{5}{16}$
$6\frac{4}{9}$

(28) Subtract

yr.	mo.
1959	4
1941	10

(29) $40 \overline{)\ 12}$

27 .....

28 ....yrs. ....mo.

29 .....

(30) $.16 \overline{)\ .912}$

(31) 5% of \$285 =

(32) $6 \div \frac{2}{3} =$

30 .....

31 \$.....

32 .....

(33) $\frac{7}{20}$ of anything is what per cent of it?

33 .....%

(34) $3\frac{2}{3} \times 2\frac{3}{4} =$

(35) Subtract

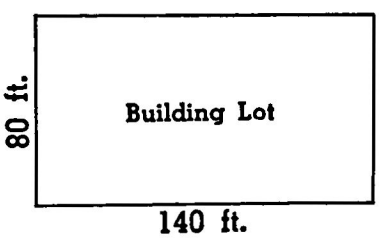
$54\frac{7}{12}$
$36\frac{2}{9}$

(36) $\frac{3}{8}$ of anything is what per cent of it?

34 .....

35 .....

36 .....%



(37) What is the area of this building lot?

37 .....sq. ft.

(GO ON TO NEXT PAGE)

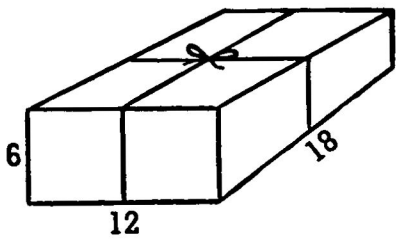
(38) $25.92 is what percent of $432?

38 _____%

(39)

$26^2 =$

39 _____



(40) How long is the string that was used to tie this package? (Do not include the knot and bow.)

40 _____

(41)

6 is to 9 as 100 is to_____

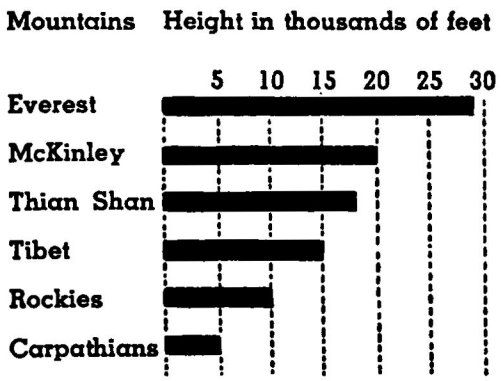
41 _____

(42)

$6 = 14 - x$

$x =$

42 _____

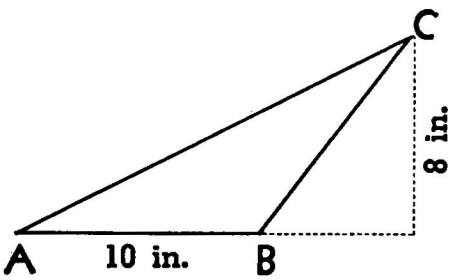


(43) According to the chart, the height of the Carpathians is what per cent of the height of McKinley?

43 _____%

(44) According to the chart, the height of Tibet is what per cent of the height of the Rockies?

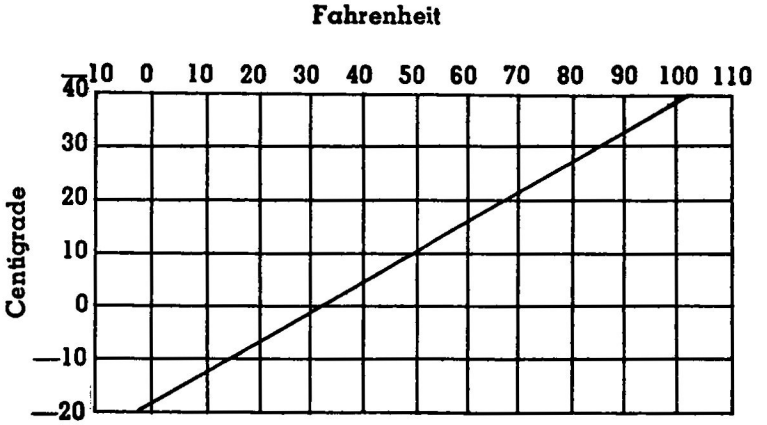
44 _____%



(45) Find the area of the triangle ABC.

45 _____sq. in.

This graph shows the relationship between the temperature readings of centigrade and Fahrenheit thermometers.

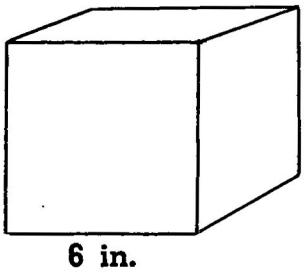


(46) When the centigrade reading is 30 degrees, what is the Fahrenheit reading?

46 _____ degrees

(GO ON TO NEXT PAGE)

(47) When the Fahrenheit reading is 50 degrees, what is the centigrade reading? 47 ..... degrees



(48) Find the area of the total surface of this cube. 48 .....sq. in.

(49)

$x/4 = 9/12$

$x =$

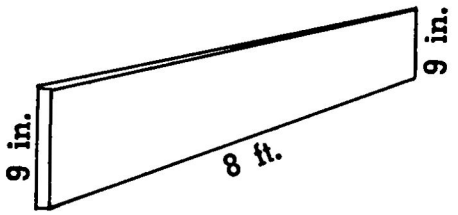
(50)

$4n + 6 = 21 - n$

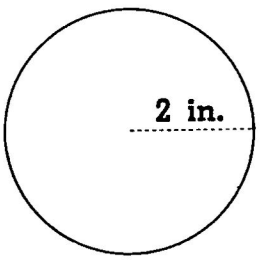
$n =$

49 .....

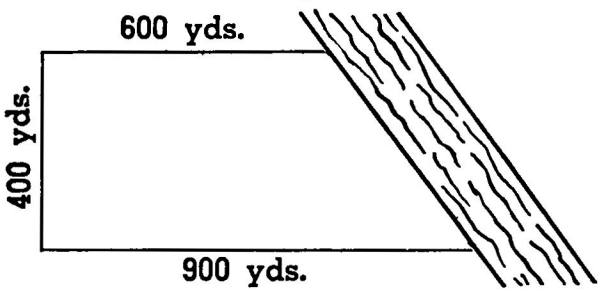
50 .....



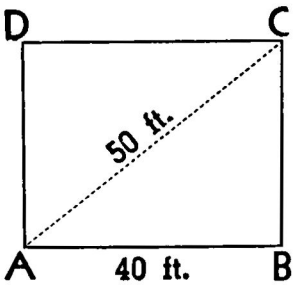
(51) What is the area (no. sq. ft.) of one side of this board? 51 .....sq. ft.



(52) Find the area of this circle. ($\pi = 3.1416$) 52 .....sq. in.



(53) What is the area of this field by the river? 53 .....sq. yds.



(54) Find the width (line BC) of this rectangle. 54 .....ft.

No. Right..... *Score*.....

No. right	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Score	40	42	43	45	46	48	49	51	52	54	55	56	58	59	61	62	64

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
65	66	68	70	72	74	75	77	79	81	83	85	87	88	89	90	90	91	92	92	93	93	94	94	95	95	95	96	96	96	97	97	97	98	98	98	99	99